

Electric Railway Journal

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Another Competitor for Electric Railway Labor

CONSTANT vigilance, plus full information, will be necessary if the scourge of Spanish influenza is to be stamped out promptly. The disease has made unwonted progress in some sections and it is a deadly, insidious menace wherever large or small groups of workers congregate. The federal government has placed \$1,000,000 at the disposal of the United States Public Health Service, and employers will have every assistance in their efforts to combat the evil. After full instructions have been secured from the local health authorities, strict discipline should be enforced, for the spread of the influenza is quick and deadly once it gets a foothold. Aside from humanitarian considerations, electric railway labor is scarce enough now, and there should be no opportunity, through ignorance or neglect, for further depletion of the ranks.

Central Argentine Electrification Worthy of Special Study

THE electrified zone of the Central Argentine Railway in the suburbs of Buenos Aires, described elsewhere in this issue, presents a number of interesting contrasts and parallels with analogous installations in this country. The car design will possibly attract most attention. The wide gage of the track, 5 ft. 6 in., and the freedom from tunnel limitations, permits a very unusual width of coach—10 ft. 6 in. over corner posts. The seating capacity is therefore very roomy, and there is ample space underneath the car for motive power and control equipment. A car width as great as this has occasionally been reached in steam road practice, but it is almost a foot greater than the usual coach in this country and exceeds by a still greater margin the cars built here for subway use. The arrangement of vestibules is also noteworthy, as the center one separates the body into two distinct sections. The entrance and exit ways are narrow for quick passenger transfer, but evidently speedy loading and unloading qualities are not necessary requirements for the service.

The Buenos Aires electrification naturally suggests comparison with the New York and Philadelphia terminals now under electric operation and with others which contemplate such operation. It is an 800-volt, third-rail installation. As it employs multiple-unit trains, it is comparable with the Philadelphia-Paoli-Chestnut Hill lines, the New York, Westchester & Boston Railway, the suburban equipment of the New York Central, Pennsylvania and New Haven Railroads at New York, the Hudson & Manhattan Railroad and the West Jersey & Seashore Railroad. Included in such comparison also should be such roads as the Aurora, Elgin & Chicago Railroad and other lines which do the same

character of business, although not associated with any steam road. In these we see a great variety in power supply, method of current collection, car design, station layout, etc. It is merely necessary to suggest the names of the roads and the items to be compared to indicate the wideness in range of ideas exemplified.

Company Sections Should Push the Loan Campaign

THE American Electric Railway Association has a dozen company sections, fairly well distributed over the country and reaching away out into the Pacific. These sections are just getting waked up for the winter. The Fourth Liberty Loan drive, coming as it does just as the winter's work is getting up speed, offers them an unprecedented opportunity for doing three things, at least. First, there is the chance to show qualities of real patriotic local leadership for which the section should stand. Second, the example of vitality at this time will help the country-wide section movement. Third, the reaction on the section itself will "set it up" for the season and insure a good year's work. As was demonstrated in a review of company section work printed in the issue of this paper for Oct. 27, 1917, page 767, the sections have an honorable record already. The record of these three Fourth Liberty Loan weeks should make the past record look insignificant.

Public Service Railway Gets 7-Cent Fare to Cover Higher Wages

THE action of the Board of Public Utility Commissioners of New Jersey last week in granting a 7-cent fare with a charge of 1 cent for a transfer to the Public Service Railway is evidence of the growing tendency of public utility commissions to recognize that electric railways must be kept in operation, that additional expenses brought about by the abnormal condition of the labor and material market must be taken care of by additional receipts and that a prompt increase in fare is less of a public evil than reduced electric railway service. The additional expense and expense liability assumed by the Public Service Railway since the last award by the board in July when a charge of 1 cent for a transfer was granted were, of course, the increase in wages ordered by the War Labor Board. Under the decision handed down last week, the railway company is not only entitled to recoup itself for this additional expenditure, so far as future operation is concerned, but also for the amount of back pay at the higher rate of wages to which the War Labor Board held that the employees were entitled. The 7-cent fare granted, it is estimated, will bring the company's sur-

plus back on March 31, 1919, to its original condition, after which a 6-cent fare with a 1-cent charge for transfers will be adequate to pay the present wages and enable the company to meet its other operating expenses and charges.

We regret that the commission in this decision still declined to make any allowance to the company for earnings on its capital stock. The board seems to consider its duty done, at least for the present, when the company is able, to quote from the decision, "to meet its operating expenses, pay bond interest and rentals on leased properties, and provide an annual appropriation of \$800,000 for depreciation." A more liberal attitude must be taken later if the company is fully to discharge its duties to the public in the way of building extensions and making other improvements when necessary, but the present allowance at least is assurance that the company will not be permitted by the commission to go into the hands of a receiver.

Deferred Classification for Necessary Electric Railway Employees

WE ARE LIVING in a period of high pressure. Everyone feels as if he must work faster and for more hours each day than he has been accustomed to in the past so that all the energy which he possesses may be put into the work of beating the enemy. To use a transportation analogy, the present time is the "rush hour" of the nation. It will not continue long, we hope, but while it lasts we must put forth our maximum effort. But, to continue the analogy, "break-downs" or "blocks" have a habit of occurring during the rush-hour period, so that it behooves us to take all possible steps to minimize their tendency to occur and to shorten their duration when they do happen.

The action of the New York District Draft Board in placing the local transportation systems among the industries essential to the national interests and deciding that the classification of the men essential to their operation and maintenance should be deferred in the present draft is in accord with this position. It would be most inopportune if our transportation systems should break down during this rush-hour period of the nation. Yet they will if the responsible heads of departments in the different companies neglect to see that those employees who are legitimately essential to the conduct of these systems make proper claims for deferred classification on account of their employment in an essential industry. The very wording of the new questionnaires places this duty on employers, so there should be no hesitancy on the score of fear of embarrassing the work of the draft boards.

If this should not be done there is danger that the electric railway companies of the country will find some morning that perhaps one-half of their employees have "failed to report," having gone to war. Then indeed would there be a real rush-hour calamity, for with the reduced forces now available, there cannot be much more of a reduction of personnel before the roads will have either to cease operation or curtail the service to a degree which will almost cripple many communities. This fact should be fully explained not only to the draft boards but to the employees as well, so that there may be no misunderstanding of the situation.

Chicago Politicians Loath to Abandon Traction Issue

THE "traction debates" now going on in Chicago give an excellent illustration of the value which the politician places on the transportation question as a campaign issue. This is all the more curious in the Chicago situation because the approaching election campaign is not one in which the traction question should figure. The subject of the bitter discussion is the consolidation and subway franchise which has already been approved by the City Council to the extent of ordering it submitted to the judgment of the public at a referendum on Nov. 5. The ordinance in question proposes to have the local surface and elevated companies turn their property over to a board of public trustees for operation on a service-at-cost basis. All that the companies will get out of the deal, if it is approved, is an assured return at a reasonable rate on a valuation fixed by disinterested experts.

The pending measure lacks many of the provisions which the management of the two companies sought to have incorporated in it. It originated with the special attorney for the Council committee—Walter L. Fisher—who has looked after the interests of the city for many years in matters of this kind. The ordinance was approved by the committee which had previously rejected an ordinance indorsed by the traction interests. It has been recommended strongly by the leading newspapers of the city. In order to avoid conflict with political issues the date of Nov. 5 was purposely selected for the public referendum, because at that election there is to be no vote for Mayor or aldermen of the City Council.

Notwithstanding these favorable conditions for a disinterested discussion of the measure it was first "indicted" by a grand jury before whom the State's attorney had made charges of corruption connected with its passage. This official did not "make good" on his charges. Next, the measure was vetoed by Mayor Thompson who, failing in this way to have it rejected by the aldermen, announced that he would take the platform against it in the coming campaign.

The crux of the situation seems to have been pointed out by the father of the measure, Attorney Fisher, who has shown very clearly in several addresses that the critics of the franchise do not know what they are talking about. He insists that correct information is the last thing these individuals want. They do not desire a better ordinance but no ordinance. They are determined to prevent a settlement of the traction question at the coming election because they need it for further political use. It may be just a coincidence that persons who are now most active in assailing the ordinance have been mentioned as candidates for political office at an election which takes place early next year.

If this trustee plan becomes effective, it will be removed from politics for an indefinite term because the grant is for an indeterminate period. The people of Chicago have been clamoring for improved service. It would appear that the proposed ordinance will give them ample facilities at actual cost. It will indeed be unfortunate if a clique of voluble and impassioned critics succeed in clouding the issue so that the voters are led astray in judging a measure which has been worked out by compromise after years of discussion as to the city's needs in the way of transportation betterment.

Why One-Man Cars Have Less Trouble from Defunct Transfers

THAT the fears we conjure up vanish when we put new ideas to the test is certainly proving true in connection with one-man car operation. One of these fears was that the operator, because of his variety of duties, would be more readily imposed upon through bad transfers than a conductor. In practice, the reverse is the case, largely because the argument must be conducted at the front end in sight of all the riders and in the hearing of most of them. Thus the principle of pitiless publicity gets in its fine work. Furthermore, the holder of the transfer will soon forfeit any sympathy which the other passengers might otherwise have for him for the reason that the operator will not start the car until fare has been paid—something quite different from arguing on the back platform with a conductor while the car bowls along as usual. In fact, railways operating one-man cars in connection with improved service say that the passengers show much more sympathetic understanding of the platform man's duties than they did in the days of two-man operation.

Are the Women Conductors in Cleveland to Be Discharged?

THE decision against the further employment of women conductors in Cleveland as a result of the recent investigation there by Federal Inspectors Diemann and Russanowska (we hope they are Americans) is meeting with widespread dissatisfaction and criticism in the Forest City. The basis given for this conclusion by the agents with foreign names is that "there is no reason why the shortage should not be filled with men," and the Federal Labor Department, when appealed to, declared that since last January its employment office in Cleveland has had 13,500 more applications for jobs than requests by employers.

If by this we understand that there are 13,500 able-bodied men in Cleveland with the moral and intellectual standards required of conductors who are walking the streets looking for jobs unsuccessfully, we suggest that the situation is one which could well be called to the attention of the War Industries Board and the Fuel Administration, as well as to that of the Provost Marshal General. If these men are not needed in the Army, could not they be used on the farms, or in some of the steel mills near Cleveland or in mining more coal with which we have all been put on short rations? It would seem that the interests of the nation would be far better served by the use of these men in any one of the ways described than on an electric car, watching a fare box and making change.

It is interesting to record that the Cleveland Chamber of Commerce is not accepting the present decision complacently but has urged the Labor Department to reopen the case "on the broad question of policy and of national interest." It says that the ruling has given widespread dissatisfaction to the working people of Cleveland, that it tends to discourage women from entering industry on patriotic or economic grounds and that it has produced a condition of uneasiness and uncertainty on the part of women in industry. The present women conductors, some 200 in number, are also protesting against discharge from work which they feel

entirely qualified to perform and for which many left other positions.

Undoubtedly the *Cleveland News* represents the general feeling in Cleveland and elsewhere, when it says in a recent issue that the ruling "is hard to reconcile with the statement of high government officials that the country is confronted with a shortage in man-power aggregating 1,000,000 men in unskilled labor alone."

How Railway Men Can Help Beat the Kaiser

SHOP foreman, master mechanics, and superintendents of equipment are as much engaged in war work as if they were in the front-line trenches somewhere in France. Their trenches are the pits for inspection and overhauling, their soldiers the workmen with greasy overalls instead of khaki and with shop tools instead of guns. The fight is in the car shops, and ammunition is mighty scarce just now. The equipment, too, is showing the effect of the war, but millions of industrial workers must be carried to business and home again with safety, comfort and "on time." The work of the shopmen is most patriotic, and it is essential to the most necessary of our war industries. Men are steadily realizing their responsibilities, and attention is being focused on lagging workers and employers alike.

What is needed is a speeding up of this transition period which is affecting all railway properties. Each must insist on the rigorous execution of its principles and turn to account every last ounce of individual effort. The use of labor-saving devices should be extended, and any new ideas that will help relieve the difficult situation should be adopted. "Necessity is the mother of invention," and necessity certainly exists for a more energetic following up of car maintenance and repair. Let all become efficiency experts and assist in fighting the battles at home. The equipment will not continue to operate on its stored-up resources, so that new ones must be treated.

What are the factors of the problem? First, material for renewals and repairs must be obtained. Is the department with which you are connected doing all it can in the way of reclaiming old parts? Study the scrap heap and determine what is necessary to put old or apparently obsolete parts back in service again. What changes in material can be made so as to substitute those that can be obtained readily for those that are next to impossible to obtain. What materials are available in your locality? The nation's transportation facilities are taxed to the utmost just now. Buy your material as near home as possible.

Next in regard to labor. Foremen report that it takes twice as long now to complete a job as formerly, due to the inexperienced help that must be used. Are you using women employees for the less essential operations so as to release men who have been brought up in the shop atmosphere and who can be trained rapidly? Many operations in overhauling can be done by piece-work. Give your laborers a chance to earn more money and get the work out quicker.

These and scores of other similar questions arise, and the right answers must be found immediately. To waste time, labor or material in these times is to fight on the side of the Kaiser.

Heavy Electric Traction on the Central Argentine



Central Argentine Railway Has in Operation an Up-to-Date Electrified Section Serving the Northwestern Suburbs of Buenos Aires

ON AUG. 24, 1916, electric operation was inaugurated on one of the lines of the Central Argentine Railway from Retiro terminus in Buenos Aires to Tigre on the Las Conchas River by way of Victoria. While the Central Argentine has a total mileage of 3300, of the 23,000,000 passengers carried during the year ended June, 1914, 16,000,000 were carried on the three sections which serve the northwestern suburbs of Buenos Aires. From the beginning the new service has been remarkably successful from both the engineering and the traffic standpoints.

The complete electrification includes a 15,000-kw. power station, 57 miles of high-tension transmission cables, three traction and two other substations, and the electrical equipment of 100 miles of single track. Power is produced in three-phase form at 20,000 volts, 25 cycles. It is supplied to the trains at 800 volts through a third-rail. The important features of the electrification are shown in the accompanying map.

BUENOS AIRES IS A REMARKABLE CITY

The reason for the great suburban traffic near the nation's capital is that the city has a population of more than 1,500,000, or more than one-fifth of the population of Argentina. The city handles more than half (in value) of the total imports and exports of the country, and this business will soon increase greatly. All of the great railways converge toward it; it is the center of government, and its climate is good. For twenty years past its growth has been at the average rate of 7½ per cent per annum.

The power house for the electrification is located on

swampy ground between the Tigre line and the Rio Lujan, some 3000 reinforced concrete piles having been driven down 33 ft. to support its weight. A concrete cap 2½ ft. thick, reinforced with old rails was cast on top of the piles, with conduits imbedded in it to carry the station power cables.

The plant contains six B. & W. marine-type boilers of 4170 sq.ft. heating surface each; four Parsons horizontal reaction turbines, with high and low-pressure cylinders, connected to three-phase, 25-cycle 2500-volt generators; and the modern steam, electrical and mechanical auxiliaries. The essential details of the equipment will be taken up in a later issue.

The turbine and boiler rooms are arranged parallel to each other with coal and ash-handling sidings behind the latter. In front of the turbine room are a rotary converter substation, a laboratory and the offices. A fittings shop and workmen's accommodation are provided at the permanent end of the turbine room, the other being arranged for later expansion.

The buildings are steel frame structures paneled with reinforced concrete and finished with a white cement. The substations and offices are roofed with concrete, the boiler room with corrugated iron, and the engine room with a wood ceiling covered with waterproof felt with corrugated iron on top.

The boilers are arranged four on a side, grouped in pairs, each boiler having its own superheater and economizer. One steel chimney with induced-draft fans serves each pair of boilers, and forced draft is supplied to the furnaces by four fans in the basement.

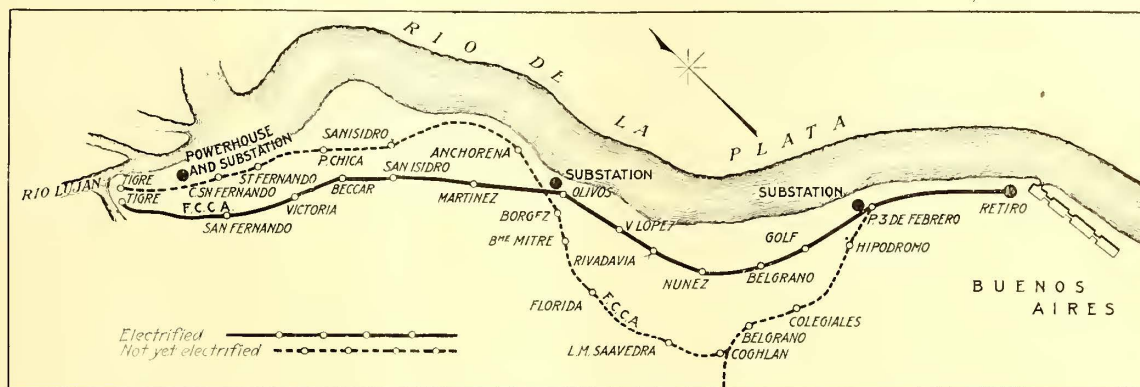
The rolling stock equipment was laid out on the mul-

tiple-unit system to provide the best service for the local conditions, the required passenger service being of a suburban character. The rolling stock ordered was as follows: Fifty-five motor coaches each equipped with two motors; twelve motor coaches each equipped with four motors, and fifty trail coaches. All are of the saloon type with cross-seats.

In Buenos Aires two classes of seating accommoda-

Seating arrangements are largely dictated by government regulations, which require a minimum distance of 15½-in. between seats set *vis-a-vis*, and further that the length of seats be not less than 18½ in. and 15½ in. per passenger in first and second-class coaches respectively. In addition, the gangway between seats must be at least 21⅝ in.

The height of the motor-coach floor above the rail



MAP OF ELECTRIFIED LINE OF CENTRAL ARGENTINE RAILWAY BETWEEN RETIRO TERMINAL AND TIGRE

tion are provided, first and second, the ratio of higher to lower-class tickets sold being about 1.4 to 1. For this reason the first-class equipment provided was fifty-two motor cars and thirty-seven trail coaches, while the second-class comprised fifteen motor coaches and thirteen trailers.

All four-motor coaches are first-class and will be used to haul trains made up of a motor coach at each end with six first-class trail coaches between. These trail coaches were taken from the old steam rolling stock and equipped only with control wiring. These trains will be used on days of specially heavy traffic.

The limiting features in designing the coaches were:

- (1) The high standard of comfort to which suburban passengers in Buenos Aires are accustomed;
- (2) the provision of vestibule connection between coaches;
- (3) the existence of low platforms necessitating steps up into the coaches;
- (4) the provision of a driving compartment at each end of every coach;
- (5) the use of vacuum brakes. As required by the climate the coaches are large and airy, the extra wide gage of the track permitting considerable latitude in design. The height from floor to center line of the semi-elliptical ceilings of the saloons is 8 ft. 7¼ in. and the width between side posts is 9 ft. 7½ in. Eight 6-in. ventilators are fitted in the roof and in addition four 38-in. fans are installed in the first-class coaches.

The lower side sashes slide upward and all windows are provided with upper and lower louvred shutters to keep out sunlight. The shutters are covered with fine mesh copper-wire gauze to keep out mosquitoes.

level is 4 ft. 2 in., requiring by government regulation three intermediate steps. There is a door at each end of the coach and also one in the middle, the latter being double and 5 ft. wide. As the doors have to be set back from the side line of the coach to provide room for the three steps, it was not possible to arrange the sills beneath the body side from end sill to end sill, or even between bolsters. In the case of the motor coaches, therefore, the main longitudinals were spaced 7 ft. apart. They consist of built-up fish-bellied steel girders, 2 ft. 6 in. deep in the center, with holes cut out of the web for lightness and to facilitate access to the electrical equipment. These main longitudinals run from end sill to end sill and support the angle-bar side sills, which are interrupted to clear the footsteps by means of



INTERIOR OF TEN-TRACK CARHOUSE AT VICTORIA

pressed steel brackets. The main members of the trailer underframes are two 12-in. channels spaced 3 ft. apart and running from end sill to end sill, stiffened with king and queen trusses to support the body sills by means of transverse cantilevers. The motor coach floors are 7/64-in. steel plates, roughened with indentations. The plates are covered with "Induroleum," a non-inflammable composition.

The trail-coach floors are of pitch pine, and they are laid in two layers each ¾ in. thick.

The end vestibules are 4 ft. wide, and contain the driver's brake valve, master controller and the hand-brake wheel. As the English rule of the road is observed in Buenos Aires, and as the wayside platforms are not of the "island" type on the Central Argentine suburban lines, the driving position had to be on the left-hand side of the train in order that the motorman

might see the guard's signals without leaving his position.

Duplicate doors are provided so that when the vestibule is used for passengers the electrical gear is all closed off. When it is used as a driving compartment the step well is covered by a $\frac{3}{16}$ -in. checkered fall plate hinged to the door. A removable circular stool of the "music-stool" type is carried by the fall plate, the end of the leg being placed in a hole in the plate.

The concealed framing of the coaches is of pitch pine, and all exposed framing and the finish of the outside and of the vestibules are of teak. The interior finish of the first-class coaches is light wainscot oak, and of the second-class coaches pitch pine. The ceiling sheets are white millboard on red deal matched boarding.

The vestibule seats in the first-class coaches are upholstered in rattan, the fixed seats in the second-class coaches being framed with pitch-pine slats.

The coaches are lighted by three two-light fittings with Holophane glass globes, down the center of the ceiling, and eight pendants down the sides of the saloon. A single-light pendant is fixed above each entrance and a headlight, two signal lights and an illuminated destination indicator are provided on each end of each coach.

VACUUM BRAKE IS USED ON THESE CARS

As the vacuum type of brake is used by the Central Argentine a rather unusual arrangement of equipment was necessary. The service duty required the provision of a pump for each two-motor equipment capable of exhausting 50 cu.ft. of free air per minute. Under working conditions of joint and valve leakage this equipment produces a 20-in. vacuum in the train system within twenty-two seconds after complete destruction.

The two brake cylinders on each motor coach are 24 in. in diameter and the capacity of each is augmented by the vacuum reservoir. In the four-motor coaches space could not be reserved for the reservoirs beneath the underframe, so they were slung between the roof and the ceiling in the center vestibule.

The operating gear consists of a partial rapid-acting valve, an emergency valve and the driver's brake valve and controller. A Simplex gage shows the pressure in the train pipe, and a vacuum horn is connected up to the system to take the place of the whistle or bell used for signaling purposes on steam lines.

THREE TYPES OF SLACK ADJUSTER ON TRIAL

In order to provide automatic compensation for wear of the brakeshoes three sets of six coaches each were fitted with slack adjusters of three distinct types: the Monarch, the Hills and the nut-and-ratchet types.

The last-named consists of a tubular nut in the main pull rod and rotated by a pawl and ratchet. The box which carries the pawl is formed with a segment of a two-miter wheel which gears with a similar portion carried on a vertical stud attached to the crosshead at the end of the pull rod. The periphery of the second miter wheel is anchored to the underframe by means of pitch chains which thus cause it to rotate in response to the travel of the pull rod.

The range of the gear is sufficient to allow the brake piston to make a full stroke when operating through

a badly adjusted brake rigging, and thus to gather the slack till a normal condition is reached. When the brake is released the pawl will cause a partial rotation of the nut whenever the working stroke is sufficient to turn the miter gear through an angle of 60 deg.

A CHANNEL-SHAPED CONDUCTOR RAIL

The collector gear consists of an underrunning shoe which makes contact with the under surface of a channel-shaped conductor rail. The shoe casting is carried on an oak beam fixed to lugs on the axle boxes.

The collecting "shoe" has two motions: (1) An up and down movement to follow the level of the conductor rail. This is controlled by helical springs on a horizontal axle passing through the block to which the shoe is bolted. (2) A sidewise movement to allow for the end play of the axle boxes and for want of alignment of the rail. This is controlled by leaf springs bearing on the suspension links of the shoe.

The difference in height of the top of the shoe in its extreme position is 2½ in. Its horizontal movement

TABLE I—DETAILS OF ROLLING STOCK—GAGE OF RAILS 5 FT., 6 IN.

Coaches:	Motor Coach	Trailer Coach
Length over buffers.....	65 ft. 3 in.	65 ft. 3 in.
Length over headstocks.....	61 ft. 11 in.	61 ft. 11 in.
Length over body.....	63 ft. 3 in.	63 ft. 3 in.
External width of body.....	10 ft. 3½ in.	10 ft. 4½ in.
Height from rail to center of buffer.....	3 ft. 5 in.	3 ft. 5 in.
Height from rail to top of roof.....	13 ft. 2½ in.	13 ft. 2½ in.
Height from rail to floor.....	4 ft. 1½ in.	4 ft. 1½ in.
Height from floor to ceiling.....	8 ft. 7½ in.	8 ft. 7½ in.
Distance between centers of trucks.....	40 ft., 0 in.	40 ft., 9 in.
Number of first-class passengers seated.....	72	68
Number of second-class passengers seated.....	66	63

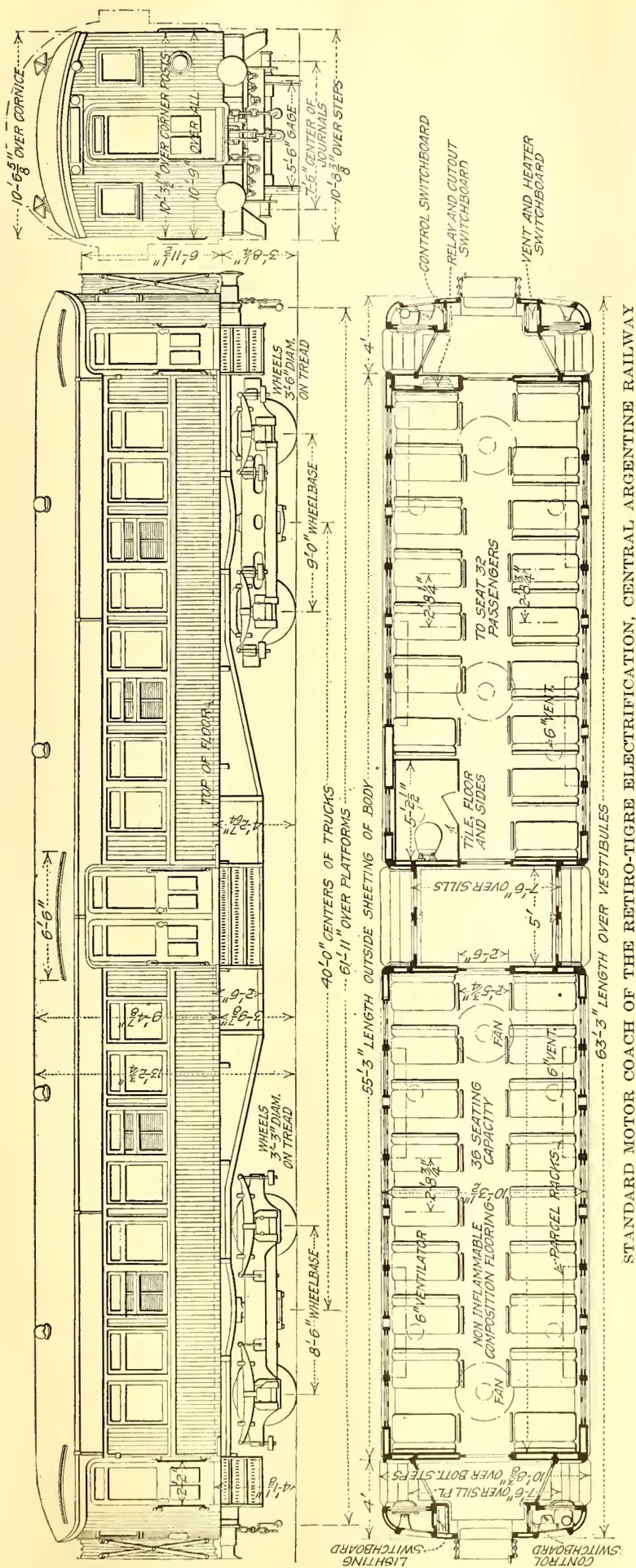
Trucks	Motor Coach	Trailing Coach	Trailer Coach
Wheelbase of truck.....	9 ft. 6 in.	8 ft. 6 in.	8 ft. 6 in.
Diameter of wheels.....	3 ft. 6 in.	3 ft. 3 in.	3 ft. 3 in.
Diameter of axle at center.....	7 in.	5½ in.	5½ in.
Size of journal.....	10 ft. 3½ in.	9½ ft. 4½ in.	8 ft. 4½ in.
Distance between centers of journals.....	7 ft. 6 in.	7 ft. 3 in.	7 ft. 3 in.
Width over side frames.....	6 ft. 10½ in.	6 ft. 9 in.	6 ft. 9 in.
Length over headstocks.....	14 ft. 8 in.	13 ft. 9 in.	13 ft. 9 in.

	Weight of Rolling Stock (Empty)		
	Two-Motor Coaches, Tons	Four-Motor Coaches, Tons	Trailer, Tons
Coach body, underframe and trucks.....	39.0	40.5	33.2
Electrical equipment.....	11.5	20.5	1.3
Total weight.....	50.5	61.0	34.5
Weight per passenger seat.....	0.74	0.84	0.4

is 3 in. The average upward pressure is 28 lb. The shoe body and extension links are of cast steel, machined to gage. The shoe is of cast iron and is designed to break when it strikes an obstacle. If desired the shoe can be locked down in such a position that it clears the conductor rail altogether, thus enabling the equipment of a coach to be isolated. Shoes run about 130,000 miles before they are worn out.

The average distance between stations on the Tigre route is 1½ miles. The local trains make a schedule speed of 22½ m.p.h., which can be increased to 25 m.p.h. if desired without overloading the equipment. For this service a two-motor equipment was adopted, each motor having to deal with a load of about 45 tons. The GE-235 motor was selected, this motor having a one-hour rating of 250 hp. The gear ratio used is 70:22.

The trains are also required to make express or semi-express runs at a schedule speed of 37½ m.p.h. This condition is provided for by reducing the excitation of the main field by 50 per cent in one step.



Provision for ventilation is made in the form of a rectangular opening of 160 sq.in. at the pinion end with arrangements to take a flexible duct communicating with the interior of the coach. Air can be drawn through this duct if it is found that there is too much dust in the air taken direct from beneath the coach. The air entering this opening passes to the commutator end between the fields and over the surface of the armature, returning through ducts in the core. It is expelled through openings in the upper part of the end shields by a fan fixed on the armature shaft.

DETAILS OF POWER AND BRAKE CONTROL

Automatic control is used in starting, the multiple-unit control equipment comprising fifteen main contactors. A "notching" relay is used to regulate the rate of acceleration. The interlocks are mounted on spindles at the back of the contactor arms and are operated by them. The vacuum pump and motor are mounted in a framework slung to the under-frame. The pump is a single-acting two-cylinder machine coupled to the motor through a helical spring coupling. It is geared down 4 to 1 by a chain inside the pump casing.

The pump motor is of 3-hp. capacity. The motor is series wound and a series resistance, which can be short-circuited, permits it to be run at two speeds, one approximately double the other. Normally the motor is run at half speed to maintain a vacuum against leaks and to permit the use of the vacuum horn. When the driver's brake handle is put into the "release" position the brake controller cuts out the resistance and the motor runs at full speed until the required vacuum is obtained. When the brake handle is put into the "running" position the resistance is again inserted in the motor circuit.

There are four positions of the driver's brake handle, as follows: (1) Neutral position, in which the motor is stopped, and the train and pump pipes are not connected together. (2) Release position, in which the motor is running at full speed, and the train and pump pipes are connected through the full gate in the driver's valve. (3) Running position, in which the motor is running at half speed, and the train and pump pipes are connected through half gate in the driver's valve. (4) Application position, in which the motor is running at half speed, the train pipe is open full to atmosphere, and the pump pipe is blanked off.

The "deadman" device on the controller consists of a pilot valve operated by a knob on the main handle. When the knob is released this valve admits air to the emergency valve which is thus actuated and opens the train pipe to atmosphere, blanking off the pump pipe.

STANDARD MOTOR COACH OF THE RETIRO-TIGRE ELECTRIFICATION, CENTRAL ARGENTINE RAILWAY

For the care of the electric rolling stock a new car-house was built at Victoria. It is about 700 ft. long and contains ten tracks. The rails are raised from the floor on longitudinal concrete supports. Power for moving the coaches in the carhouse is supplied from overhead trolley wires carrying small carriages from which hang cables which can be plugged into the train-line sockets on the coaches. An existing shed was adapted as a repair shop by raising the roof and installing 20-ton traveling cranes.

The routine maintenance of the rolling stock consists of a nightly inspection and a "shed day" once in two weeks. It is intended to give a heavy overhaul when cars come in for wheel turning, which will be for the motor coaches after running 60,000 to 80,000 miles, and for the trail coaches after 100,000 miles.

The carhouse and repair-shop staffs comprise two shifts of thirty-one men each, with seven other men employed in the shops during the day only and three rolling stock examiners who are stationed at Retiro. The electrical equipment of the tracks comprised the bonding of track rails, the erection, bonding and protection of the conductor rails, the laying of interconnecting cables across gaps in the conductor rail and the provision of switch gear for dividing up the track into short electrical sections.

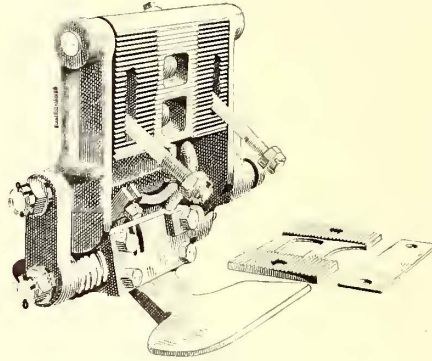
In connection with the electrification the whole route

The standard gap is about 7 ft. and the width 6½ ft. The track rails are carried across on wooden beams having the upper corners chamfered off to reduce the foothold. The fences are carried up to the trench and a footway with a locked gate is provided for the use of the maintenance men.

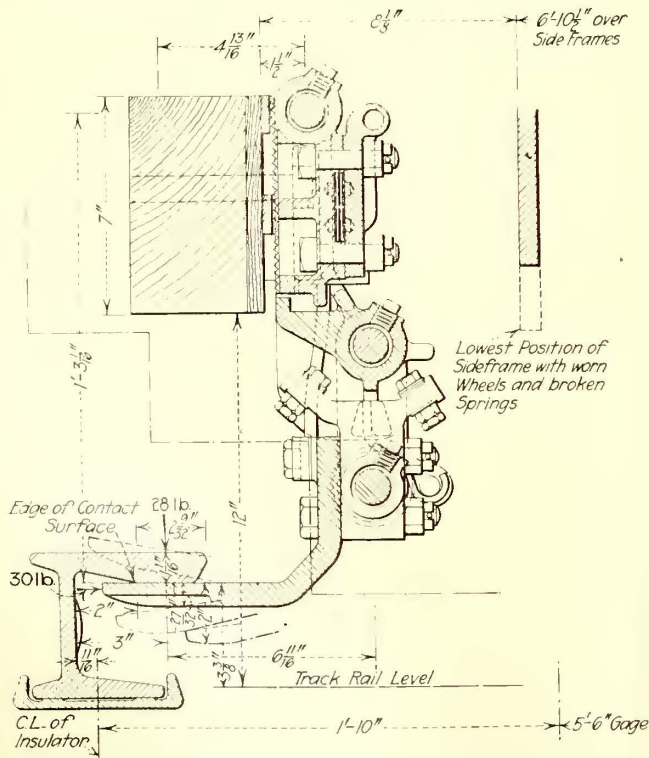
Other incidental improvements were provision under every rail of four ties of extra length for the insulators and the installation of new track fishplates.

The conductor rail is of special form, weighing 36 lb. per yard. The composition of the high-conductivity steel is: Carbon, 0.03 per cent; silicon, none; sulphur, 0.05 per cent; phosphorus, 0.06 per cent; manganese, 0.36 per cent. The electrical resistivity of the steel is 6.7 times that of copper. Cast-steel ramps are used in connection with the conductor rail.

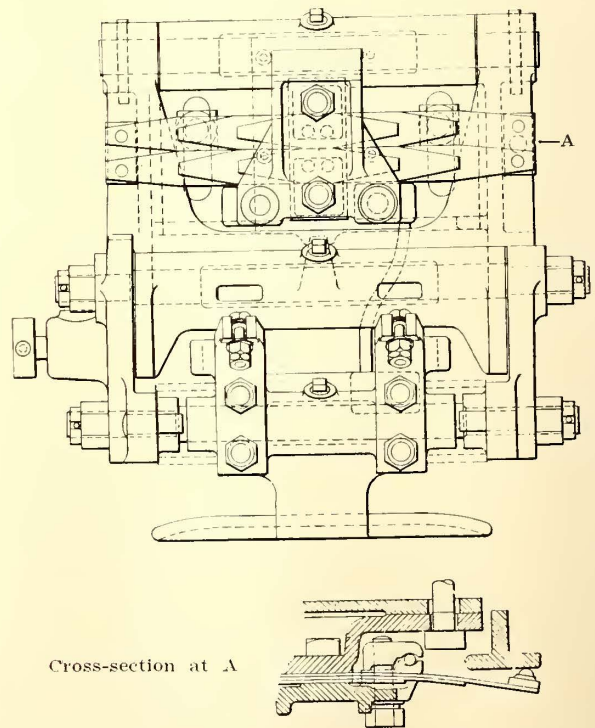
The particular form of rail that was adopted was designed to protect particularly the trespassers on the tracks, trespassing being much more prevalent in Argentina than in most countries. It was felt that the common form of flat-bottom rail with sideboards attached would be too exposed, and it was not possible to provide a top cover or adopt the American type of underrunning rail on account of the limited space available between the structure and load gages. The form shown in one of the accompanying drawings was selected as occupying the minimum space consistent with



FLEXIBLE COLLECTING SHOE



DETAILS OF COLLECTING SHOE AND ITS MOUNTING, AND OF THE CONDUCTOR RAIL, C. A. R. ELECTRIFICATION



was fenced with wire netting and, to prevent people and animals from straying onto the line at crossings, special "cattle-guards" were installed. Each of these consists of a trench dug across the tracks parallel to the road, with brick retaining walls and concrete inverts.

proper clearance and permitting a very complete insulating covering.

The fishplates are single and applied to the back of the rail, the boltheads being countersunk to provide a free passage for the toe of the shoe. Two bonds with

solid plug heads are fixed under the fishplates, giving a cross-section of $\frac{1}{2}$ sq.in. of copper at each joint. Where gaps occur the rails finish off with cast-steel ramps 5 ft. long.

The rails and ramps are covered with a protection of creosoted wooden boards, built up in the shops and fixed in position on the ground by hammering over the ends of steel strips to embrace the edges of the top table and foot of the rail.

The rail is carried on malleable-iron castings cemented into porcelain insulators which stand on the ends of long ties and are fixed to them by malleable-iron clips. The ties are of Argentine hardwoods which are very difficult to drill and cut. They are not finished very square, and in order to provide a flat, soft bearing to allow for the running rail sinking into the ties, packing pieces consisting of creosoted pine boards $\frac{1}{2}$ and $\frac{3}{4}$ in. thick are placed below the insulators. The insulation of the rail is very good, the usual weekly figure for leakage being between 1 and $1\frac{1}{2}$ amp.

To prevent creepage, every length of conductor is anchored and no length exceeds a half mile. The anchors are of three types: (1) Insulated links attached to a plate either fixed in a block of concrete or fastened down to a tie. These are used on long lengths of rail. (2) Clips on the foot of the rail which bear against the cap of a special insulator. These are used on lengths of rail up to 2100 ft. (3) Clips on the rail which engage the lug on a standard insulator. These are used for anchoring one or two rail lengths.

Where the rail is cut to leave room for expansion (say one-quarter mile from an anchor) a short length of rail is mounted behind the gap and bonded to the main rail.

SECTIONALIZING THE TRACK ELECTRICALLY

The conductor is so divided into sections by switches mounted in signal cabins that the signal men can quickly isolate any faulty section, leaving the rest of the system unaffected. Provision is made for paralleling the "up" and "down" conductor rails in order to make full use of their combined conductance.

The sectionalizing switches are normally of 1000-amp. capacity, and of the quick-break, knife type. Interconnecting switches and those feeding the tracks in Retiro terminus are automatic circuit breakers.

Emergency switches are provided at the crossovers at wayside stations to allow trains to discharge passengers and setting back to the other line when a fault occurs beyond a platform in a section containing several stations. Sidings and the platform lines at Retiro are controlled by switches mounted in cast-iron boxes, with a danger signal showing when the switch is closed.

The electrical equipment of the track is maintained by seven gangs of five men each. One of these men is a foreman and another is an examiner who goes over his section every day and reports matters requiring attention.

A FINE OPERATING RECORD

The first twelve months of operation showed an excellent record of continuity. The total numbers of times the supply to the conductor rail was interrupted were: Under one minute, sixty-six; over one minute, forty-two. The motor coach mileage was 1,782,000 and the trail coach mileage was 1,353,000. The total num-

ber of trains run was 41,706, and the total amount of time by which all trains were late arriving at the termini was 817 minutes. The percentage of trains arriving late was 0.213, of which 0.129 per cent were five minutes late. These figures include delays to trains caused by late running of other trains.

ENGINEERS AND MANUFACTURERS LISTED

The Central Argentine electrification was carried out by Messrs. Merz & McLellan of London, England, with the co-operation of the railway's consulting engineers, Messrs. Livesey, Son & Henderson.

The whole of the apparatus used in connection with the electrification was manufactured in Great Britain, and the principal contracts covered the erection of their plants by the several contractors. The largest firms and their respective parts of the work were as follows: Babcock & Wilcox, Ltd. power-station buildings and complete boiler-house equipment; C. A. Parsons & Company, Ltd., turbo-alternators, transformers and motors; British Thomson-Houston Company, Ltd., switch gear in the power station, auxiliary motors, etc., electrical equipment of substations, electrical equipment of rolling stock and supervision of erection of electrical equipment of permanent way; W. T. Henley's Telegraph Works, Ltd., high-tension transmission and low-tension track cables; David Rowell & Company, Ltd., structural steel for the power-station entrance way, test room, offices and substations, and cranes for the substations; and Metropolitan Carriage, Wagon & Finance Company, Ltd., and Birmingham Carriage & Wagon Company, Ltd., rolling stock, bodies, underframes and trucks.

Provision of the foundations for the power station and substations, walling of the substations, excavation for cables and erection of the third-rail were the work of the railway company itself.

Women as Conductors

WHERE the work of conductors has been undertaken by women—and it is being carried on to a large extent in Great Britain and the United States as well as other countries, chiefly, it must be admitted, as a war necessity—it is being done successfully and without any apparent ill effects. Any detrimental moral effect which there may be is infinitely less than in many occupations in which women are now working under war necessity, and so far as any evil physical effects are concerned, women have been engaged for generations in work supposed to be natural to the sex, with far greater physical danger than when acting as conductors on up-to-date street cars.

The argument is also used that it is not required that women be engaged in this capacity as a war necessity, as should there be a real shortage of men for the work, which does not appear to be admitted, returned soldiers should be engaged to fill vacancies as they occur, since men in broken health or those who have lost a leg could fill the position. The weakness of this argument is apparent, when it is contended that returned soldiers, broken in health or minus a leg, would be able to stand the strain involved better than a woman of ordinary physical capacity.—*Canadian Railway and Marine World.*

Dissecting Passenger Interchange Time Graphs

In This Article the Author Shows How an Interchange Time Graph Can Be Built Up From Simple Elements and Separates Some Actual Graphs Into Their Component Parts

BY D. D. EWING

Professor of Electric Railway Engineering, Purdue University, Lafayette, Ind.

GRAPHS showing the rate of passenger interchange, that is, the relation between the time per passenger and the number of passengers boarding or alighting from a car, have been familiar to students of electric railway traffic for a number of years. Since, for given traffic conditions, each type of car has an interchange time graph peculiar to itself, these are of great importance in comparing car performance. Examples of this type of car characteristic graphs for the Fort Worth (Tex.) cars are given in Fig. 1. These were plotted from data published in the *ELECTRIC RAILWAY JOURNAL* for Sept. 22, 1917, page 476. It is, of course, understood that they represent the average of many observations and are, therefore representative of the performance of the car when carrying an average passenger load.

While such graphs readily permit of performance comparisons between different types of cars working under the same traffic conditions they do not so readily permit of an accurate analysis of the performance of an individual type of car. For such analyses it is more instructive to plot another form of car characteristic, namely, the graph showing the relation between the total time of stop and the number of passengers boarding or alighting from the car. Such graphs for the Fort Worth car are shown by *A B* in Figs. 4 and 5. The analysis of these into component parts is possibly best understood by first going through the process of building up such a graph with certain elementary assumptions as a foundation.

ELEMENTS OF THE INTERCHANGE TIME GRAPH

From one point of view, possibly, the real ideal car is one whose interchange time for all sized groups of passengers, is zero, that is, a car which will pick up its load on the wing as it were. Practical considerations, however, require that we set up a more reasonable ideal. We may arrive at this as follows: Suppose that a group of persons formed into a long column be walking past a certain point at a uniform rate of speed. (A column of soldiers marching past a point is a good illustration). These persons will pass the point in question at the rate of so many seconds per person. We can for convenience call this rate the rate of traffic flow. The time required for a given number of persons to pass the point will be the number of persons multiplied by the rate of flow, this rate being expressed as so many seconds per person, for example, one and five-tenths seconds per person.

Now if the point referred to be the car door and the operating conditions such that the car is stopped for only the flow time of the group, then the graph showing the relation between duration of stop and number

of passengers interchanged will be a straight line as *A B*, Fig. 2. The rate of flow in this case is arbitrarily assumed as two seconds per passenger. Any change in this rate will affect the steepness of the slope of *A B*.

It will be seen that for any size group the $\text{total stop time} = \text{rate of flow} \times \text{number of passengers}$, or letting the time be represented by y and the number of passengers by x , $y = mx$, where m is the flow time in seconds per passenger.

An equation giving the total time per passenger can be obtained by dividing the above equation through by the number of passengers, or letting y_1 be the interchange time per passenger, $y_1 = \frac{y}{x} = \frac{mx}{x} = m$, a constant, = the flow time per passenger.

Under our hypothetical conditions, therefore, the graph showing the rate of passenger interchange is a straight line parallel to the horizontal axis of coordinates. Such is *C D* in Fig. 2. Comparing this graph with actual graphs for passenger interchange as shown in Fig. 1 we see that only the right hand end of the actual graphs bear any resemblance to our ideal graph. Evidently we must look for other influencing factors.

STANDARD FORM OF INTERCHANGE TIME GRAPH

Keeping our idea of passenger flow in mind, let us suppose that some little time elapses, both before the head of the passenger column reaches the car door after the car has stopped and before the car starts after the rear of the column has passed the door. This assumption is in accord with what actually takes place in the process of car loading. The total interchange time graph will now be as *A B* in Fig. 3, where the intercept *O A* represents the total of this elapsed time. In the figure it has been assumed as five seconds. In practice it is usually less than this figure.

For a given size of passenger group now, the $\text{total stop time} = \text{a constant time period} + [\text{rate of flow} \times \text{number of passengers}]$,

or, calling the constant time period, b , $y = b + mx$,

and $y_1 = \frac{b}{x} + m$

Thus the interchange time per passenger is now the flow time plus a portion of the constant time period. As the number of passengers in the group increases the constant time charged to each passenger decreases. By plotting the last equation, the graph *C D*, Fig. 3 is obtained. This shows a general likeness to the graphs of Fig. 1. Further, since our assumptions have included all of the factors affecting the duration of stop which are beyond control in the design of the car and in the arrangement of loading platforms we may set up this form as our ideal with which actual graphs may be com-

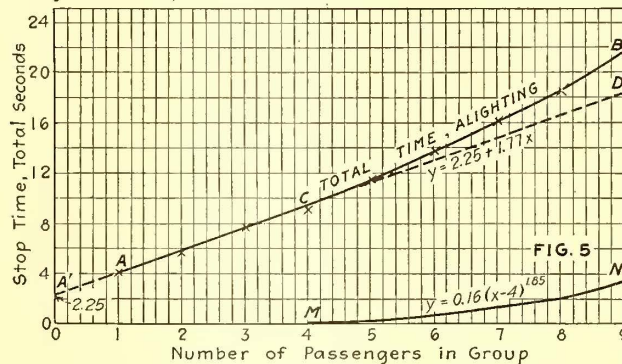
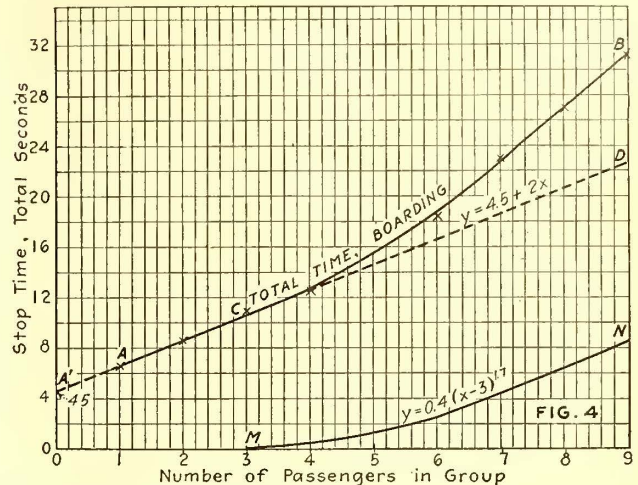
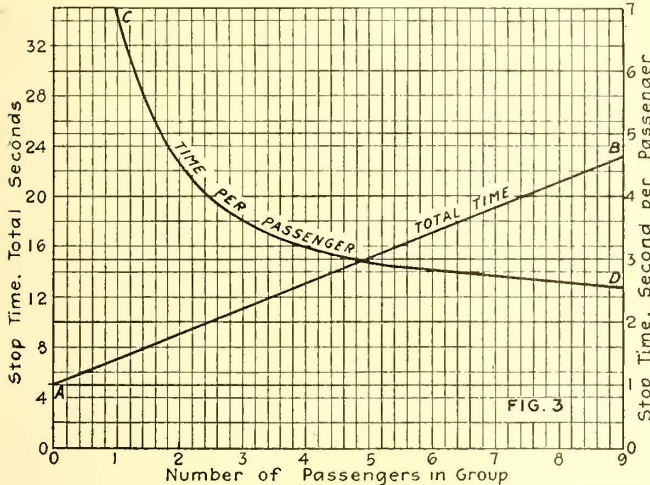
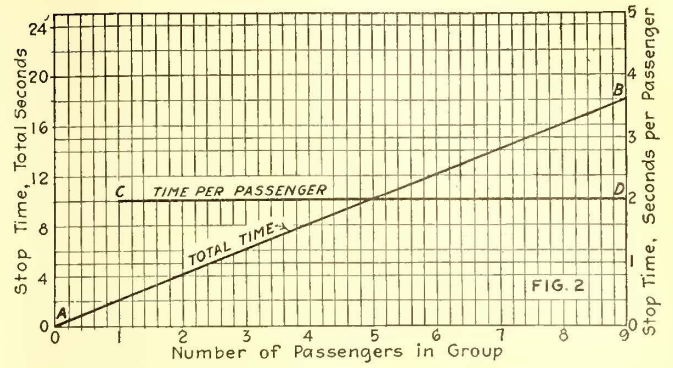
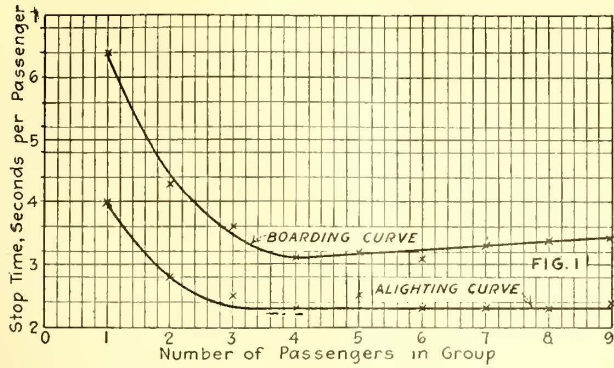


Fig. 1—Passenger-interchange graphs for the Fort Worth car

Fig. 2—Ideal passenger-flow graph

Fig. 3—Standard form of interchange-time graphs

Fig. 4—Analysis of the total-stop-time boarding graph, passengers boarding

Fig. 5—Analysis of the total-stop-time graph, passengers alighting

INTERCHANGE TIME GRAPHS BUILT UP FROM SIMPLE ELEMENTS

pared. For the same reason the graph *AB*, Fig 3, should be our measuring stick for comparisons of total interchange time graphs. Obviously, while the intercept *OA* and the slope *m* cannot be zero, they should be as small as possible.

With the form of our standard graph in mind we may now proceed to analyze an actual graph, as *AB*, Fig. 4. By extending this to *A'*, its intercept on the time axis, symbolized by *b* in the above equations, is obtained. A scrutiny of the actual points indicated by small crosses on the co-ordinate sheet indicates that for groups up to three or four passengers the points fall on a straight line, but for the larger groups a curve best fits the points. For the case in hand the straight line is *A'D* whose equation is

$$y = 4.5 + 2x$$

Translated this means that the constant time period is four and five-tenths seconds and the rate of flow is one passenger every two seconds. If the ordinates of the line *A'D* be subtracted from the like ordinates of *A'B* and the remainders be plotted, the graph *MN* results. The physical significance of the ordinates of this resi-

due part is that they represent the slowing up of the rate of passenger flow due to congestion somewhere in the passenger stream. The equation of this residue graph, or rather an equation which will fit it without serious error, is

$$y = 0.4(x - 3)^{1.7}$$

The equation, or rather the equations for the line *A'B*, are therefore

$$y = 4.5 + 2x$$

for all groups of three passengers or less and

$$y = 4.5 + 2x + 0.4(x - 3)^{1.7}$$

for the larger groups.

In this equation the constant term, 4.5, represents the constant time period which is independent of the number of passengers boarding the car; the coefficient of the second term, 2, is the rate of passenger flow expressed in seconds per passenger, and the third term is indicative of the amount of congestion in the passenger stream. The corresponding equation for the interchange time per passenger is

$$y_1 = 2 + \frac{4.5}{x} + \frac{0.4(x - 3)^{1.7}}{x}$$

in which the last term again is a measure of the congestion. The effect of this term is apparent in the boarding graph, Fig. 1, it being the reason for the upward inclination at the right instead of a downward inclination as in our standard graph, *C D*, Fig. 3.

A similar analysis of the alighting graph, *A B*, Fig. 5, gives for groups of four or less passengers the equation,

$$y = 2.25 + 1.77x,$$

and for larger groups,

$$y = 2.25 + 1.77x + 0.16(x - 4)^{1.85}$$

The difference between the constant term of this equation and that of the boarding equation is at least partly chargeable to fare collection. Also the difference in the rate of flow is probably due in part to the fact that people naturally walk downhill faster than uphill.

No attempt is made in this article to discuss all of the factors which affect the terms of the interchange time equation, and therefore the shape of the corresponding graph. Suffice it to say that with known operating conditions these terms, namely, the constant-time-period term, the passenger-flow term, and the congestion term, together with their influencing factors may be studied and analyzed. Such studies should yield rich results in the form of improvements both in car design and in operating methods. For a more extended discussion of the factors which affect the duration of stop the reader is referred to an article by the writer in the *ELECTRIC RAILWAY JOURNAL* for April 22, 1916, page 768.

High Percentage of Ash in Coal Is "Up to" the Miner

A PROPOS of the editorial in the issue of the *ELECTRIC RAILWAY JOURNAL* for Sept. 28, the *Coal Age* has the following to say on the same subject:

"Of course the logical place to rid coal of its objectionable impurities is before these impurities have had opportunity to begin their work—that is, objectionable impurities should never be allowed to travel farther or in any other direction than the coal face to the gob, a few feet away. Once bone or slate enters a mine car it begins to be a drag and drain upon transportation, and it never ceases its bad work until it lands upon the ash heap of the ultimate consumer. The farther it travels the more harm it does. The journey from face to gob is the shortest possible and consequently the least expensive.

"When a coal bed contains high ash impurities and the miner is paid by the ton; when the cry is constantly for coal and more coal; when miners are scarce and employers can ill afford to fire anyone, the temptation to load out everything that comes down is ever present and to some it is apparently irresistible. The loader who succumbs to this temptation certainly does not realize the effects of his iniquities. He sees only a chance to clean up his place a few minutes early, or possibly get out an extra car of coal before quitting time. He does not realize that in loading out bone and slate and similar impurities, he is 'giving aid and comfort to the enemy.'

"American miners as a class are unquestionably patriotic. Should you search the country over from Tamaqua to Issaquah it would be difficult to find one who would willfully do aught to aid the Kaiser or any

of his inclement brood. None would knowingly or willingly harbor an enemy agent or spy within his gates—he would like nothing better than the chance to turn such a person over to the proper authorities. The enemy agent is in this country—figurately speaking—to throw sledgehammers into the gear wheels of American industry. The miner who loads out dirty coal accomplishes the same result. He could scarcely perform a greater service for the Hun were he actually in the Kaiser's pay."

Electric Railway Men and Safety

An Abstract of H. B. Adams' Paper, Presented at the Safety Conference Held in St. Louis, Is Printed This Week

THE Seventh Annual Safety Conference, held at St. Louis, Mo., Sept. 16 to 20, inclusive, attracted a good attendance of electric railway men, especially at the electric railway section meeting held on Sept. 19. An abstract of one of the papers presented before this section is given below and others will appear later.

THE SMALL COMPANY AND INTENSIVE TRAINING

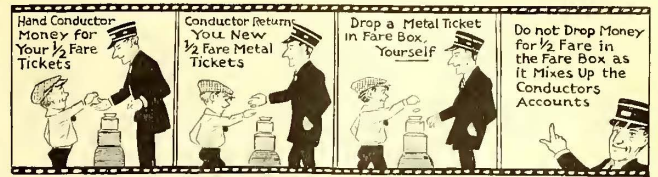
H. B. Adams, safety supervisor Aurora, Elgin & Chicago Railway, emphasized the point that intensive training for efficiency is just as necessary on a short line with few employees as on the largest systems. After outlining the procedure in training motormen and conductors, with particular reference to safety, he made a number of suggestions as to the ways in which interest in safety work can be maintained. In substance these were as follows:

The general manager should have frequent meetings with all foremen to impress them with the importance of seeing that every employee does his work in a safe manner. Interest is maintained by the use of attractive bulletins, by meetings at which accidents are discussed and ways suggested for their prevention, by the showing of safety films and slides, and by short, encouraging talks from officials and foremen, with free discussion.

Occasional social gatherings should be held, and the programs for such gatherings should be of a cheerful and uplifting nature. The relations of employer and employee, as such, should be eliminated.

Every electric railway company desires the good opinion of the communities which they serve. The attitude of the company and its employees upon the question of safety has a powerful influence upon the general reputation of the company. If it is generally known that the company and its employees are cordially co-operating to prevent accidents the public will be more receptive of suggestions for safety.

Electric railways are merchants, selling transportation. In order to hold the trade, transportation must be always in stock—of good quality, regular, prompt and for sale at a reasonable price. It must be nicely wrapped with courtesy, tied with the highest degree of care, sealed with caution and delivered in an absolutely undamaged condition. To this end, every individual connected with the merchandising of transportation, no matter in what department, must do his full share.



PUTTING UP INFORMATION IN SUGAR-COATED DOSES AT DENVER
(Originals in Several Colors Respectively)

Publicity for Metal Tickets

Denver Tramway Inaugurates 6-Cent Fare With Intensive Publicity Conducted During Three Days

AS was announced in the *ELECTRIC RAILWAY JOURNAL* on Sept. 14, page 479, the Colorado Public Utilities Commission on Sept. 12 granted the petition of the Denver Tramway for emergency relief effective on Sunday, Sept. 15. On all city lines a 6-cent fare was instituted with a 3-cent fare for children. Thus the 6-cent fare was made effective three days after the decision was rendered. It might be assumed that very little publicity could have been given to the change before it actually went into effect, but this was far from being the case.

As a convenience both to the public and the trainmen in the respective paying and collecting of the 6-cent fare, it was considered highly desirable to use a metal ticket and thus eliminate the handling of a large number of copper coins. To attain in any considerable degree the results desirable with such a radical change some publicity was required. The salient features of the campaign were briefly as follows:

In the first place a series of cards were posted in conspicuous positions in the cars, the first two on Sept. 12, the day the increase was granted, and the remaining three on the three following days successively. A series of posters were also displayed on Sept. 13. These were sent to a large number of employers accompanied by a letter from the general manager, F. W. Hild, explaining the increase in fare and why the metal tickets had been adopted, and asking co-operation in impressing upon their employees the advantage of purchasing the tickets.

On Sept. 13 also, large posters, 18 in. x 38 in., were placed in all carhouses and clubrooms of the company, directing attention to the issue of *Tram-O-Grams* which

would appear on Sept. 14, and urging the conductors to give the issue wide distribution. A half-page advertisement was run in the local papers on Sept. 14, explaining the 6-cent fare, the metal tickets, etc., and on the same day the special issue of *Tram-O-Grams* was placed in the cars. Very explicit printed instructions were issued to the trainmen on 3½-in. x 6-in. leaves for their looseleaf notebooks, together with copies of a change making table.

In order to clear up any question which might arise after the first few days of operation with the 6-cent

Questions About Six-Cent Fare Answered

"1. The Fare Six Cents On All Tramway Lines?" "It has not yet been decided whether or not both full and half fare tickets will be issued on all lines. A nickel and a penny will be used for the full fare and a nickel for the half fare."

"How Much Do Children Have To Pay?" "If the child is under 12 years of age, he will pay 3 cents, including the fare for the ride."

"Are There Any Changes For Transfers?" "No."

"Is The Fare Increased On Crown Hill Line?" "The fare on the Crown Hill line will be increased to 6 cents on the 15th of September."

"Will The Fare Be Six Cents On Interurban Lines To The City Limits?" "No."

"6c Metal Tickets - Start I Use Nickels and Pennies In Paying Fares?" "No. The fare will be paid in metal tickets. The fare will be 6 cents for the full fare and 3 cents for the half fare. The fare will be paid in metal tickets. The fare will be 6 cents for the full fare and 3 cents for the half fare."

"Half-Fares - How Do I Get A Ticket For Myself and My Family?" "If you have only one or two of these tickets, you will need to pay for each ticket and load the same and select the fare destination. If you have a metal ticket on exchange, you should drop the fare box. If you have a large number of the old tickets, you should drop them at the Denver Old Tramway Building."

6c FARE STARTING SUNDAY MORNING

Arrangements:
Adults: 6c on all Tramway city lines of Denver, Englewood and Aurora.
Children: 3c
Transfers: Exactly the same as heretofore in every respect.
Fare Payable:
 By dropping into the fare box one of the new Tramway metal tickets if you have it. Or a nickel and a penny for an adult. Children's fare should be paid by dropping children's tickets into the fare box; never drop coins into the box in payment of CHILDREN'S fare.
Metal Tickets:
 The Tramway has had new metal tickets made because other cities tell us that the public has found 4-cent metal tickets more convenient than copper.

NEWSPAPER ADVERTISEMENTS USED IN INAUGURATING THE 6-CENT FARE IN DENVER

fare, a half-page advertisement giving questions and answers concerning the tickets and payment of fares was inserted in the evening papers on Sept. 16.

Fares on the interurban lines, operated by the tramway, also advanced on Sept. 15. The schedule of rates was advertised in the form of a one-half page advertisement in the local papers.

The accompanying illustrations have been selected from the many pieces of publicity material as being typical of the spirit of the campaign.

How the Los Angeles Railway Handles Liberty Loans

The Los Angeles (Cal.) Railway handles its Liberty Loan work in the following way: The comptroller, who has charge of the sale of these bonds to employees, has as assistants the foremen of each carhouse of the operating departments and the chief clerks of other departments. They in their turn have assistants under them who get into direct touch with the employees, personally and by means of circulars. Advantage is also taken of the sectional Co-operative Association meetings to urge upon the members the necessity for buying the bonds. The company subscribes for the bonds subsequently purchased through it by employees, and deductions are made from their wages at the rate of 20 per cent a month.

Drop either a nickel and a penny—a dime and two pennies—or

6c metal TICKETS in

the fare box yourself, Conductor doesn't take out fare.

Tram-o-grams for details.
Form No. 4

BUY A SUPPLY OF 6c METAL TICKETS

FOR YOURSELF AND MEMBERS OF YOUR FAMILY

Handy coins to have because they avoid delay and pennies

5 FOR 30c

Use metal half-fare tickets for children. 5 for 15c

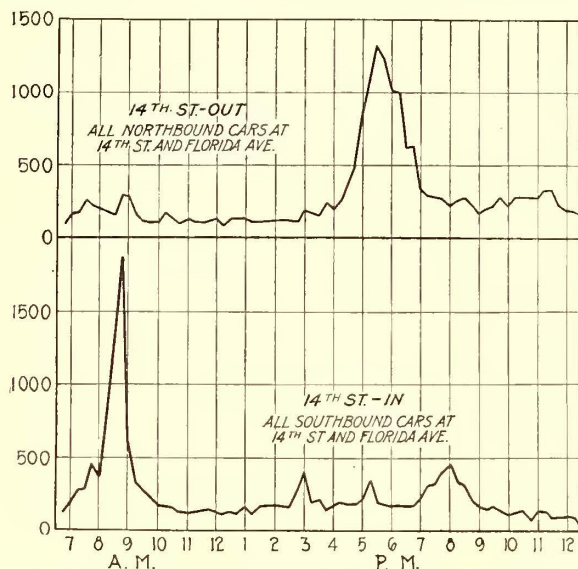
Form No. 5

TYPICAL POSTERS TELLING DENVER RIDERS HOW TO PAY THEIR FARES

Washington Increases Car-Miles and Reduces Car-Hours

Latest Beeler Report Recommends Changes in Routing and Increases in Schedule Speed as Result of Efficiency Methods Earlier Introduced

IN SECTION 12 of John A. Beeler's report on the Washington transportation situation, made public during the first week in September, a number of important revisions in routing and schedules are recommended. The report is limited to the system of the Capital Traction Company and presumably the suggestions for the Washington Railway & Electric Company will be given later. The suggestions made are due in part to the radical changes in traffic flow in the national capital, caused by the increase in government employees due to the war, and in part to the introduction



PASSENGER COUNT FOR FOURTEENTH ST. LINE, CAPITAL TRACTION COMPANY, FOR TYPICAL DAY

of skip stops, loading platforms, double berthing, precedence for street cars, etc., recommended in prior sections of the report.

As a basis for the present report, a traffic survey was conducted whose results are given in the report. In the rerouting recommended several factors received consideration. One was to retain the old routes except where there was a legitimate reason for a change as they naturally were familiar to the residents of Washington. Another was economy of man-power so that all that was available should be placed where the greatest possible amount of service would result. Again, where through routes operate from one outlying terminal across the downtown district to another outlying terminal, the traffic on the two was made as nearly equal as possible, for otherwise injustice would be worked either on the public or on the company, depending on whether the light or heavy end of the line received the proper service. Short-line service has also been introduced where observation shows that this could be done to advantage.

A chart of Fourteenth Street in and out, with the passengers counted at Fourteenth Street and Florida Avenue for fifteen-minute periods, is reproduced. This

is the heaviest trunk line of any in the district and is used by more than 50,000 people every day. The peaks occur at 8.45 a.m. inbound and at 5.30 p.m. outbound. There are also marked secondary evening peaks on the inbound lines at 8.15 p.m. and outbound at 11.30 p.m.

RUSH-HOUR SERVICE INCREASED 21 PER CENT THROUGH HIGHER SPEED

As a result of the survey four new routes were established and several of the existing routes were shortened. At the same time advantage was taken of all the improvements recently made to increase the schedule speed on all lines, as shown in Table I. The

TABLE I—INCREASE IN RUNNING SPEED WITH NEW SCHEDULES.

Route	Running Speed, Miles per Hour		Increase, Per Cent
	Old	New	
Georgetown—Fifteenth and New York Avenue	8.59	10.38	20.8
Fifteenth and New York Avenue—Peace Monument	8.23	9.15	11.2
Peace Monument—Union Station	9.34	10.37	11.0
Peace Monument—Eighth and Pennsylvania, S. E.	9.39	10.06	7.1
Eighth and Pennsylvania, S. E.—Navy Yard	9.43	10.78	14.3
Eighth and Pennsylvania, S. E.—Seventeenth and Pennsylvania, S. E.	9.32	11.39	22.2
Twenty-sixth and Pennsylvania—Seventeenth and Pennsylvania, N. W., via F Street	8.54	9.68	13.3
Seventeenth and Pennsylvania, N. W.—Twenty-sixth and Pennsylvania, via G Street	9.72	11.22	15.4
Union Station—Eighth and F, N. E.	7.40	10.17	37.4
Fourteenth and Colorado—Fifteenth and New York	9.27	10.71	15.5
Eighth and Pennsylvania, S. E.—Seventh and Florida	8.98	10.83	20.6
First and B, S. E.—Seventh and Florida via New Jersey Avenue	9.35	10.28	9.9
Seventh Street Wharves—Seventh and Florida	9.42	9.66	2.5
Seventh and Florida—Twentieth and Calvert	8.65	9.44	9.1
Twentieth and Calvert—Chevy Chase Lake	14.81	15.90	7.4
Averages	9.71	10.95	12.8

TABLE II—COMPARISON OF WORKING CONDITIONS WITH PRESENT AND PROPOSED SCHEDULES

Hours of Work	Straight Runs		Two-Piece Swings		Total	
	Present	Proposed	Present	Proposed	Present	Proposed
9	2	13	1	16	3	34
9 to 10	40	51	31	46	71	97
10 to 11	39	64	56	29	95	93
11 to 12	45	35	40	11	85	46
12 to 13	17	5	6	0	23	5
Total	143	173	134	102	277	275

general average is from 9.71 to 10.95 m.p.h. The average time for each round trip has been cut from 89 minutes to 73.1 minutes. In consequence, each all-day car will on an average make between three and five additional one-way trips per day. This means that with the same number of cars as are now operated, service will be increased 21.8 per cent, and if all available equipment is now in use during the rush hours, this figure will mark the increase in service during these periods.

The new schedule made it possible to rearrange the runs of the crews, as shown in Table II.

Circular No. 72 of Bureau of Standards Being Reprinted

The attention of the editors of this paper has been called to the fact that circular No. 72 of the United States Bureau of Standards on "Scope and Application of National Electrical Safety Code" cannot be obtained from the Government Printing Office as it is already out of print. In reply to an inquiry the director of the bureau states that the circular will be reprinted so as to be available probably in December of this year.

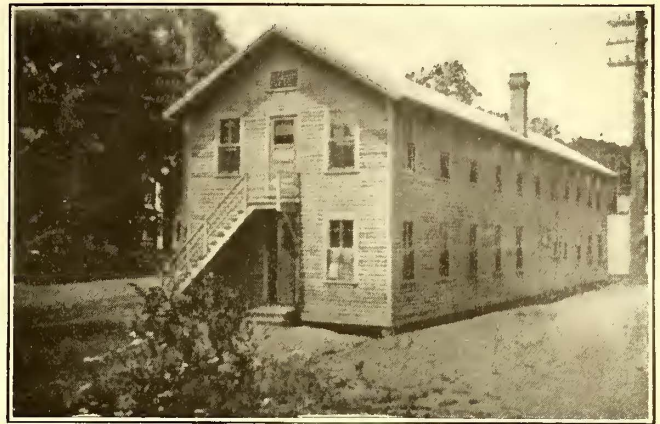
Lodging House for Thirty Men Costs \$11,000

The Connecticut Company Helps to Solve the Serious Labor Problem By Building and Operating a Rooming House at Waterbury

THE CONNECTICUT COMPANY operates in a territory where the expansion of the manufacturing industry during the last three or four years has caused a considerable shortage in housing accommodations for the workers. A few months ago the company completed at Waterbury the construction of a lodging house, somewhat by way of experiment, and this has proved very successful for the purpose intended. This purpose was to provide lodgings primarily for transients until permanent quarters can be found. The men are, however, permitted to occupy rooms in the house as long as they desire, provided the rooms are not required for the use of newcomers.

The lodging house has proved a "life-saver" in that it enables the company practically to guarantee a comfortable shelter for new men. Its popularity is attested by the fact that at present the regular bedrooms are all occupied and a number of men are being "bunked" in the clubroom on the first floor on cots.

The house contains thirty-two sleeping rooms, of which thirty are available for the men. It is operated by the company and is in direct charge of a competent woman who attends to all details of administration. The men are charged a uniform rate of \$2 per week regardless of location of room, and they pay the same rate when temporarily accommodated on cots in the clubroom. This nominal charge has proved sufficient to cover all operating expenses with a small margin for interest and depreciation. However, the management of the company will feel repaid for the outlay if the house continues to serve the purpose for which

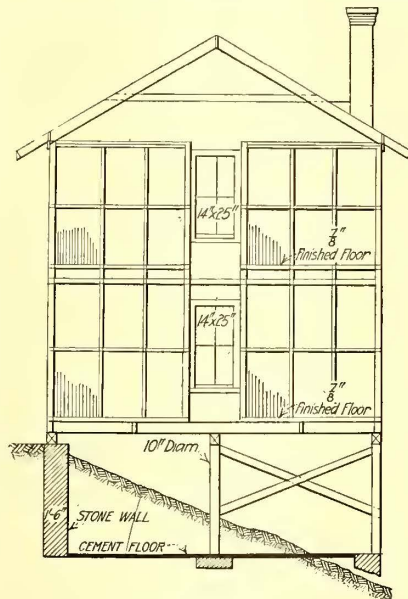


CONNECTICUT COMPANY'S LODGING HOUSE AT WATERBURY

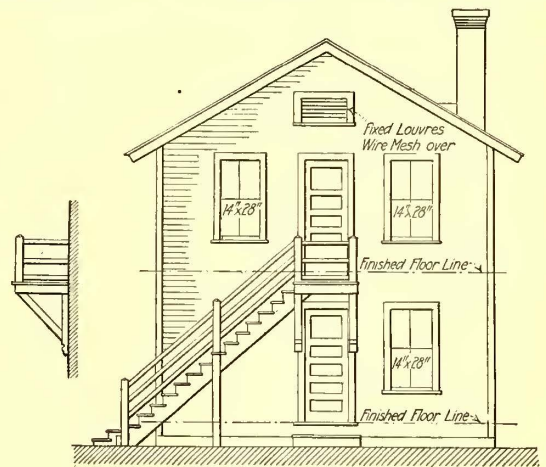
it was built even if it should not prove profitable directly as an investment.

The cost of the house was about \$11,000 complete and furnished, exclusive of the value of the land, which was owned by the company and not required for other purposes.

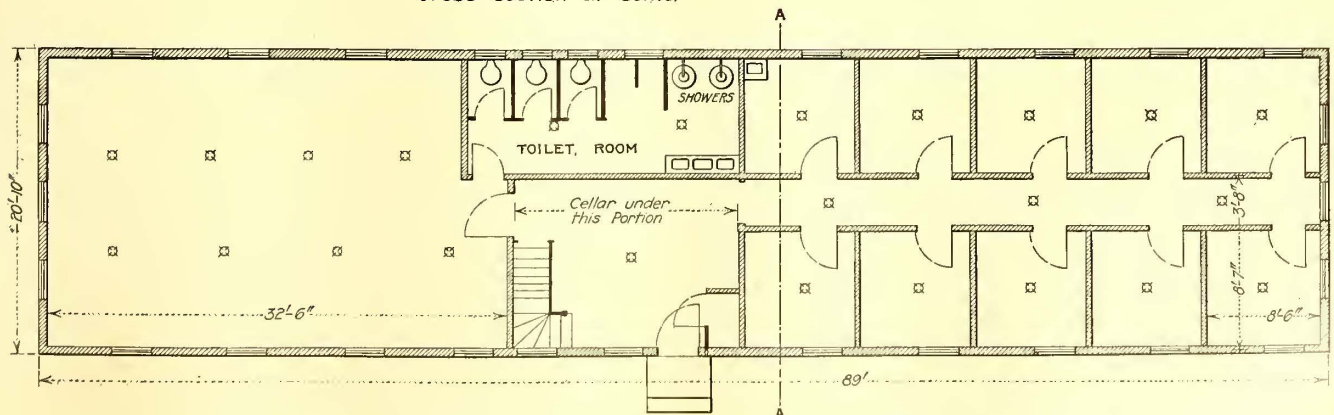
The lodging house is located between the private



Cross Section at Center



South End Elevation



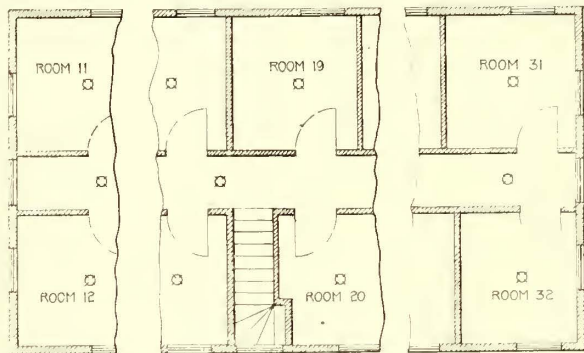
GROUND FLOOR LAYOUT AND STRUCTURAL DETAILS OF LODGING HOUSE AT WATERBURY, BUILT AND OPERATED BY THE CONNECTICUT COMPANY FOR THE BENEFIT OF PLATFORM AND SHOP MEN

right-of-way of the company and Watertown Road, west of the bridge over the Naugatuck River. It is about 1000 ft. from the local carhouse and repair shop and is thus able to meet the needs of both platform men and shopmen. It is of simple but substantial construction, without "frills," but has all modern conveniences in the way of lighting, heating and plumbing.

On the first floor is a clubroom 32½ ft. x 20 ft. in size, ten bedrooms about 8½ ft. square, a large toilet room with shower baths, and an office which furnishes the main entrance to the building. Entrance was provided through the office so that the matron could have supervision of the coming and going of the lodgers.

On the second floor there are twenty-one bedrooms, a smaller toilet room and a hallway running lengthwise of the building. An outside stairway furnishes access to the second floor, but is not intended for general use.

The building is of construction to be readily warmed in winter, the walls being covered with sheathing paper and clapboards, but it is not lathed and plastered on the



PLAN OF SECOND FLOOR OF LODGING HOUSE AT WATERBURY, CONN.

inside. The studding is exposed, but it is finished and stained. A steam heating plant is located in a small cellar under the office portion, which is large enough to accommodate also the coal bins. The heating plant is guaranteed to provide a 70 deg. temperature in zero weather. Ample hot water is supplied throughout the year for the men, a gas heater being used to warm it in summer. The rooms are all electrically lighted, and all windows and doors are screened.

By way of furnishings each bedroom contains a chair, one steel single hospital bed, a mattress and the necessary bedding, including pillows, two blankets, two sheets and a slip cover for the mattress. All bedding is laundered once a week.

The Waterbury housing experiment is the result of a conviction on the part of J. K. Punderford, vice-president and general manager of the Connecticut Company, to the effect that unusual conditions such as those which now prevail demand adaptability on the part of the electric railway. For some years he has wanted to see if the men would appreciate facilities such as those now afforded at Waterbury. The experience of the last few months has convinced him that the fundamental idea underlying the scheme is all right.

It will be interesting to compare the Waterbury housing plan with that described by Clifford A. Elliott in the issue of the *ELECTRIC RAILWAY JOURNAL* for July 27, 1918, page 150, in which the Pacific Electric Railway furnishes free housing for section workers.

A French View of Heavy Traction in the United States

A RECENT issue of *Le Génie Civil*, Paris, is largely taken up with the papers presented on "Electrical Night" this year before the New York Railroad Club. In addition to abstracting the papers (see *ELECTRIC RAILWAY JOURNAL*, March 23, 1918), the author of an article on "The Electric Locomotives of the American Railways," P. Letheule, comments upon the tendencies indicated by the locomotives discussed at the Railroad Club meeting. He says that without doubt electrical engineers would be very glad to apply in the field of electrification the tendency toward standardization which is manifest in other electrical fields. However, in the variety of locomotives discussed at the meeting, there is little evidence of this tendency, but in spite of the disparity between the tendency toward standardization and the diversity here manifested the situation is a perfectly natural one.

The conditions on different railway lines vary greatly and there are also many differences in the equipment which is available. Variety is sure to result even where there is considerable choice in selection of types, but in some cases other conditions beyond the control of the engineer dictate whether, for example, a line shall be alternating current or direct current.

The diversity of types of electric locomotives is no greater than in the steam locomotive field, and Mr. Letheule predicts that the number of types that will persist is not large. It is possibly limited to those taken up at the meeting in question with the addition of the three-phase locomotive which, he points out, has been applied very successfully in a number of instances. It will be remembered that the locomotives which formed the basis of the Railroad Club discussion were the new 180-ton New Haven type (a.c., geared), the recent 134-ton New York Central type (d.c., gearless), and the two new 265-ton Chicago, Milwaukee & St. Paul types (d.c., one geared and the other gearless).

Coal Rationing for Industries

THE controller of coal mines in Great Britain is being assisted in the coal economy campaign, which he has instituted to reduce fuel consumption in every way possible, by a technical staff attached to the head office. The country is to be mapped out in districts, so that all industrial consumers will, within a reasonable time, be in touch with the organization.

The scheme comprises two main sections, namely, electrical undertakings and industrial undertakings. The work includes a careful scrutiny of the quantity and the quality of coal consumed and the efficiency obtained, and the inspection of factories and works by experts to ascertain the best means by which fuel consumption may be reduced. A considerable amount of work has already been done, but it is intended to accelerate the rate of progress as much as circumstances will admit. About 400 fuel engineers will shortly be at work in various parts of the British Isles.

So imperative is the need to reduce coal consumption to a minimum that a rationing scheme for all industrial undertakings in Great Britain will be introduced shortly.



FIG. 1—GROUP OF WOMEN CONDUCTORS AT KANSAS CITY. FIG. 2—UNIFORM WORN BY KANSAS CITY CONDUCTORETTES

Women Conductors a Success at Kansas City

Special Housing Facilities With Matrons, Visiting Nurse and Lady Physician Are Provided—Branch of Local Union Formed

WOMEN conductors have been doing their work so successfully on the lines of the Kansas City Railways that their number has been increased from eight to more than 100 since May 21, 1918. At this time, as was noted in the *ELECTRIC RAILWAY JOURNAL* for June 15, 1918, page 1147, the first women conductors went into service on the lines of this company. In advertising for applications for positions in its platform service the company has announced that it will receive applications from young women between the ages of 21 and 35 years and that preference will be given in the following order:

Wives and relatives of employees of the company in the service of the United States; wives and relatives

of other men in the service of the United States; wives and relatives of present employees; the general public.

With the assurance that women conductors are a success, a comprehensive course has been laid out for their instruction. The applicants are selected by the employment department, and after a physical examination, conducted by a woman physician, they are sent to the instruction room. Fig. 3 shows a class at work under the instruction of one of the women of the first class. The women receive \$1.50 per day during the training period.

The preliminary instruction is divided into four parts, covering two days, about as follows: Safety work and car operation, collection of fares and clerical work, transfer system and rules and courteous handling of passengers.

After these two days of preliminary training the women are sent out to a division headquarters where they are received by a matron. Here they are put on the road with a competent platform instructor for a period of five days on one line and two days on another.



FIG. 3—INSTRUCTION CLASS OF WOMEN CONDUCTORS

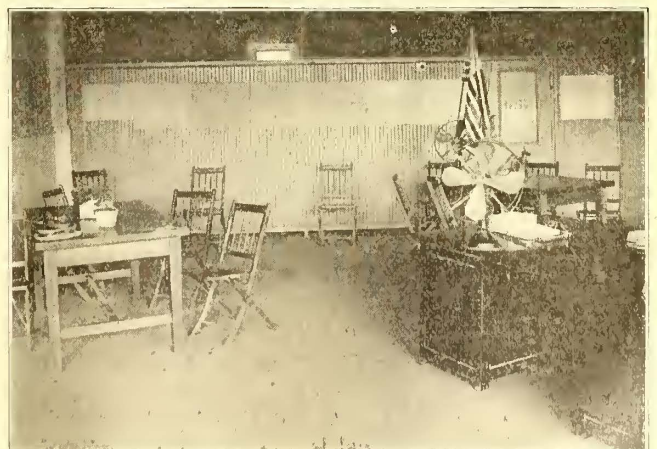


FIG. 4—TYPICAL QUARTERS FOR WOMEN EMPLOYEES

If they meet the requirements up to this point they are given written recommendations by the division supervisor and returned to the office for a final written examination. Grades of average or above average are received on this test. All the instruction is given under the supervision of the regular instruction department, and each student is examined carefully in regard to the following points: Appearance, character, intelligence, education, interest, ability, alertness, punctuality and experience.

The "conductorettes" are now ready for duty subject to occasional instruction from the women instructors at the carhouses. A uniform is provided consisting in winter of a woolen shoe-top skirt and heavy woolen double-breasted reefer, all of an olive-drab color, together with a pair of canvas leggings and an olive-drab cap. The summer outfit includes a khaki cap and skirt, tan blouse and low-heel tan shoes. The uniform is furnished by the company and paid for on the installment plan.

REST ROOM FACILITIES ARE EXCELLENT

Extensive rest rooms have already been provided and others are planned and under construction. Fig. 4 gives an idea of the arrangement of the quarters at Forty-eighth and Harrison Streets. This shows the change-making tables, with the schedules of all runs on the wall at the rear, and the matron's desk at the right. A supply of easy chairs, not shown in the picture, is in the front of the room. In the room at the rear of the one shown are several wicker couches, wash rooms, toilets, etc. One of the newest rest rooms is located at Ninth and Brighton Streets where a two-story brick building has been leased by the company for this purpose. The arrangement here is similar, except that instead of several small tables, a long table arranged for seven or eight women on each side is provided. In the middle of this table a rack several feet high and extending the full length contains the schedules. At these quarters the top floor was formerly rented as a flat and remains at present unchanged. The intention is to remodel this later to provide club rooms and a library.

At present women conductors operate on 75 per cent of the lines in Kansas City, Mo. The majority of the cars are of the pay-as-you-enter type with fare boxes. Some of the doors are manually operated, others air operated. The women receive the same pay as the men and are guaranteed a minimum wage of \$2 per day. The work is divided into two periods of not more than four hours of consecutive work, with a long rest between periods. Although the law permits women to work nine hours, the work is confined to seven or eight hours per day, and very seldom exceeds six days per week. It is generally terminated by 8 p.m.

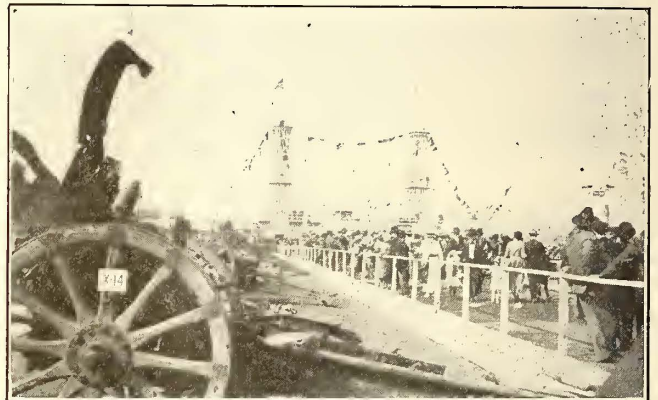
The Kansas City Railways Employees' Brotherhood, a local organization, not a part of the Amalgamated Association, opened its doors to the new employees almost immediately and an auxiliary, known as the Kansas City Railways' Women Employees, has been formed with more than 60 per cent of the women as members. Of late the Amalgamated Association has been making an active campaign to enlist the women for membership.

Many of the women have gained in weight, all

in health, and all are enthusiastic about the work. The record of efficiency shown is superior to past records as so far there have been no step accidents on cars in charge of women conductors. The clerical work shows more accuracy and neatness, and more alertness is displayed in the collection of fares and issuing of transfers. The women have made a splendid showing and are an elevating element in the service. The public has received them very favorably and every official of the company has only the highest praise for their service and the success of the enterprise.

Government War Exhibit in Chicago

A GIGANTIC war exhibition was held in Chicago by the United States government from Sept. 2 to Sept. 15. To convey an idea of the size of the exhibit, it may be stated that there were thirty-seven carloads of captured war trophies from every fighting front. In one single day 224,871 people attended, and the total attendance for the fourteen days was 1,955,602.



ENTRANCE TO UNITED STATES WAR EXPOSITION AT CHICAGO. NOTE GERMAN FIELD GUN IN FOREGROUND

The Chicago Elevated Railways entered into the spirit of the campaign and sold tickets through its regular ticket sellers at the stations. Fourteen women were also used on trains all over the system, and each turned in from \$50 to \$75 a day. The Chicago, North Shore & Milwaukee Electric Railway, which is operated under the same management, also aided in the work. Together the companies sold 89,296 tickets, 86,157 being sold by the elevated lines.

On the single day mentioned when 224,871 persons attended the exhibition, the number of passengers carried on the elevated lines was increased more than 50 per cent as compared to the days preceding the exhibition.

As indicative of the public attitude toward the skip stop at this time a recent editorial statement from the New York *Evening Post* is significant. After outlining the necessity for care in locating stops the editors said: "The general desirability of the plan in the interest of economy is not denied. One may be a bit skeptical of the admittedly rough estimate that adoption of the scheme over the country would save 1,000,000 tons of coal a year, and yet concede that it is worth the inconvenience it costs."

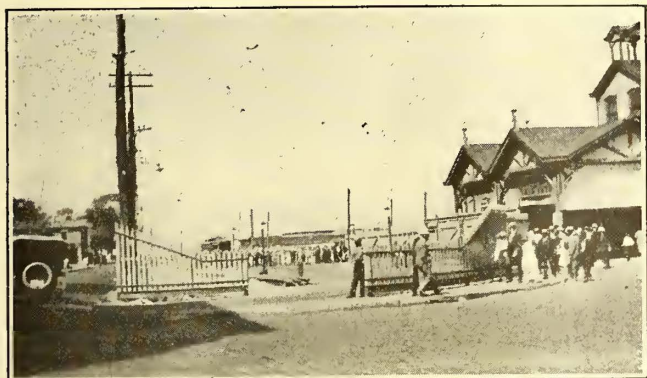
Solving a Difficult Terminal Problem

Soldier and Pleasure Traffic Congestion at Ferry Connection on Public Service Railway Is Relieved by Prepayment Area

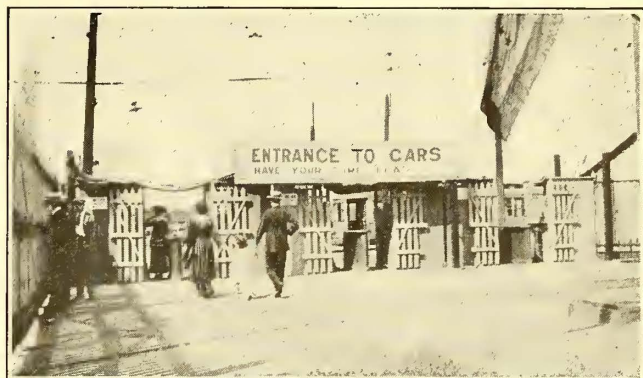
THE Public Service Railway gives service to the upper portion of Manhattan Borough, New York City, by means of its Englewood, Palisade, Hudson River and Hackensack lines, which connect at Edgewater, opposite 130th Street, Manhattan, with the ferry of the Riverside & Fort Lee Ferry Company. The Public Service Railway operates this ferry and maintains a fifteen-minute service between Edgewater and the 130th Street terminal. The lines named above reach Leonia, Paterson, Englewood, Tenafly, Hackensack and a number of other small towns within commuting distance of New York. The regular traffic which

has constructed prepayment areas for use during the heavy traffic periods both at Edgewater and at the Palisades Amusement Park entrance and exit. The area at Edgewater, as shown in an accompanying illustration, is inclosed by a wooden picket stockade and divided into two parts by movable gates. In the illustration the car entrance gate with its guard is shown in the foreground, in the background a crowd of passengers boarding a car within the loading area. As will be noted, passengers leaving the unloading platform can enter the ferry terminal directly. Access to the loading platform is gained through the turnstile gates also shown. It will be noted that three double gates, or six turnstiles in all, are provided.

A high woven-wire fence incloses the area at the amusement park entrance, and the collection booths have been installed under the waiting sheds which previously constituted the station equipment at this point.



GENERAL VIEW OF EDGEWATER TERMINAL SHOWING THE CAR ENTRANCE TO THE STOCKADE



PASSENGER ENTRANCE TO THE LOADING AREA AT THE FERRY

would naturally exist between these points and upper New York is greatly augmented at times owing to the fact that at the top of the Palisades, some 300 ft. above the river level at Edgewater, is located the Palisades Amusement Park, while farther up the river connections are made to the new natural park known as the Palisades Interstate Park and the great army cantonment, Camp Merritt.

On Saturdays, Sundays and holidays as many as 40,000 people are sometimes handled to and from the Palisades Amusement Park. On Wednesdays and Saturdays, the days on which visitors are permitted at Camp Merritt, the travel over the lines leading to the camp is also very heavy. In addition to these days on which the traffic can always be reckoned on, peak loads are frequently thrown on the railway without warning, due to large numbers of soldiers from the camp being given permission to visit New York.

During peak periods, the ferry boats deliver to the traction lines between 1500 and 2000 passengers every five minutes. The handling of these large masses of passengers has constituted a most difficult problem, and the Public Service Railway has had an elaborate terminal project in mind, equal, at least, to that now in service at Hoboken, for some years. The war has deferred for the time the development of these plans, but owing to the great increase in the army camp traffic, the congestion at the ferry terminal became so great early this summer that it was found impossible either to carry the passengers safely or to collect the fares.

As a temporary solution to the problem, the company

Before the installation of the prepayment areas, great confusion existed in the loading spaces at both places. Passengers trying to leave the cars were prevented from doing so by masses of other passengers trying to board at the same time. It was found very difficult to collect fares in the short distance, between the ferry terminal and the amusement park. The installation of the stockade has removed entirely the confusion resulting from the meeting of opposing passenger streams, all fares can now be collected, and considerable increase in safety of operation has resulted.

Steam Roadmasters Hold Thirty-sixth Annual Meeting

A MEETING of the Roadmasters' and Maintenance of Way Association was held in Chicago on Sept. 17 and 18 and it was voted to meet in the same city on Sept. 16, 1919.

The principal business was the consideration of reports of committees on conservation of track material, on fences and allied topics, and on labor-saving devices. Papers were read by C. W. Gennett, manager rail inspection department C. W. Hunt & Company, on "Common Defects in Rails and Means of Detecting Them in the Track," and by John Foley, forester Pennsylvania Railroad, on "Inspecting Ties; the Outlook for an Adequate Supply."

The secretary of the association, who was re-elected at the meeting, is P. J. McAndrews, roadmaster Chicago & Northwestern Railway, Sterling, Ill.

AMERICAN ASSOCIATION NEWS

War Board Raises Jitney Question Again

TO A GREAT MANY people it has seemed a great anomaly during the past year, when there has been such an acute demand for man-power, as well as for gasoline, rubber tires and other automobile supplies for military purposes, that jitneys are allowed to continue in operation in many cities. They duplicate service for which the electric railways have the equipment and are able to supply, so that jitney service is about as "non-essential" an industry as can well be conceived. Yet, while the "work or fight" order affects waiters in hotels and clubs and elevator men and the ordinary citizen is asked to be as sparing of gasoline as possible, jitney operation has continued unaffected just as if there were no such thing as a war in Europe.

Impressed by this condition of affairs, W. V. Hill of the American Electric Railway War Board wrote a letter on May 31 describing the situation to Major General E. H. Crowder, provost marshal general. This letter was published on page 1199 of the issue of this paper for June 22, 1918. Mr. Hill followed it on June 7 with one addressed to M. L. Requa, director of oil, United States Fuel Administration, and on July 12 with one to Addis E. Whitney, conservation division, War Industries Board. He and other members of the War Board have also been in communication with other departments of the government on the same subject, among them the transportation department of the United States Shipping Board, Emergency Fleet Corporation, the department of inland transportation of the War Industries Board, and the Highways Transport Committee of the Council of National Defense.

The general nature of the situation can be well understood from the following outline prepared by Mr. Hill at the request of Col. Roscoe S. Conklin, judge advocate at Washington, chief of classification division, provost marshal general's office, and sent to him on Aug. 29:

First. Automobiles engaged in carrying passengers for hire are performing a service that can and should be performed by the electric railways, which under municipal and state regulations are required to perform a definite and dependable service to the public.

Second. It requires an average of twelve men operating automobiles to carry an equivalent number of persons that can be transported by one electric car with two men. Their operation means therefore a wastage of man power in addition to duplication of service.

Third. They consume large quantities of gasoline, steel and other materials required by the government at this time for war purposes.

Fourth. They do not operate a continuous service, usually confining themselves to the congested hours of travel in the mornings and evenings, thereby not performing a full day's work.

Fifth. There is to-day a serious shortage of labor for essential war work, including electric railways serving industrial centers engaged in war work, cantonments, ship-building plants, navy yards, etc.

It would seem, therefore, that men engaged in non-essential automobile service of this nature should be forced to obtain some useful occupations or compelled to enter the service, and if this class of men was subjected to the "work or fight" order, it would place thousands of men in this country in useful occupations or in the Army.

The American Electric Railway War Board is now conducting a study as to the present extent and character of jitney competition.

Standard Car for Housing Corporation

THE Electric Railway War Board some weeks ago, at the request of the United States Housing Corporation, appointed a committee to prepare plans for a standard car in three types. This was covered in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 14, page 455. The committee is actively at this work and is making up plans in accordance with the following general specification:

The car will be 45 ft. to 48 ft. long and 8½ ft. wide, over all, with a height of 11½ ft. from rail to trolley board. The underframe will be of steel and the superstructure of steel or composite type. Cross-seats will be used with the exception of longitudinal seats in each end for the space of two windows. The type of roof is left to the discretion of the committee.

An existing standard type of truck will be used with wheels of from 26 to 31-in. diameter. Four-motor equipment, adapted for single-car or train operation, is specified, as is also the use of thermostatic control of the car warming system.

The three general types to be considered are: The end-entrance car for double-end operation, with air-operated platform doors, folding steps and no bulkheads. Car of the same general type and dimensions, with seat and door arrangements as submitted by C. O. Birney, embracing the pay-as-you-leave, center-exit feature for a double-end car. Center-entrance car similar to that used by the Boston Elevated Railway.

New York Conference Soon

ALTHOUGH the exact date of the conference of the American Electric Railway Association scheduled to replace the annual convention has not yet been set it is understood that it will come soon after the close of the Fourth Liberty Loan campaign. Secretary Burritt announces that at the same time the executive committee will meet and, in accordance with the practice inaugurated last year, President Stanley will retire and J. H. Pardee, first vice-president, will assume the duties of president. The other three vice-presidents will each advance one step and a fourth vice-president, *ad interim*, will be nominated by the committee. The five manufacturer members of the committee will probably be retained.

For the four affiliated associations, the same procedure as last year will undoubtedly be followed. That is, the present officers will hold over until their successors are elected. In the Accountants' Association there is a vacancy in the office of secretary-treasurer, caused by the resignation of S. C. Rogers; in the Engineering Association there is one in the office of first vice-president, caused by the resignation of G. W. Palmer, Jr., and one in the office of secretary-treasurer of the Claims Association caused by the death of B. B. Davis. The filing of these vacancies will be left to the executive committees of the several associations.

The policy pursued last year of leaving in abeyance the routine committee work both of the American and

the affiliated associations will undoubtedly be continued by the several executive committees. By this means important matters may be taken up from time to time for consideration either by standing committees or by special committees, while the less important work not dealing directly with war matters can be allowed to lapse.

Combined Social and Informational Meeting at Chicago

AT THE MEETING of the Elevated Railroads company section held on Sept. 24 at the Edison Building, Chicago, the principal speakers were H. A. Johnson, superintendent of shops and equipment, and James K. Miller of the legal department. Mr. Johnson gave what the secretary described as "a remarkably interesting and instructive talk on the electrical control system of the company's rolling stock. This was illustrated with numerous lantern slides and some very cleverly prepared apparatus, the speaker laying particular stress on the importance of the train line in the proper operation of a train and to the necessity for very careful handling of the jumpers." Mr. Miller gave an inspirational talk on enemy propaganda, and brought out clearly the damage which might result to our country's morale from the repetition of "information" which cannot be verified. There was patriotic singing, a brief program of Irish dancing and some business items, including the appointment of a nominating committee to report at the October meeting. An evidence of co-operation with other clubs was the announcement by President B. J. Fallon that the Chicago Elevated Bowling League had changed its meeting night to avoid conflict with the meetings of the company section. One hundred and twenty members and guests attended this meeting.

"Rail Light Minstrel Show" at Toledo

EIGHT hundred members and guests of the local joint company section attended its first entertainment for the season at the Auditorium Theater, Toledo, Ohio, on Sept. 25. No business was transacted at the meeting, the idea being to start off the activities of the year with a program which should arouse enthusiasm, prepare for the more serious work of the winter and incidentally set a high standard for later entertainments. The program was designed to bring in as many entertainers from the company's ranks as possible.

Skip Stops in New England

In the New England campaign by electric railways to save coal in accordance with the suggestion of the United States Fuel Administration, it has been reported to James J. Starrow, federal administrator for New England, that 4161 stopping places or 22 per cent of the 18,582 stopping places on the Massachusetts roads have been eliminated. On the Boston Elevated Railways alone about 1000 out of a total of 4000 stopping points have been wiped out and the public has accepted these changes in a patriotic spirit, apart from the possible improvement in service thus accomplished which comes as a pleasant surprise to many patrons.

Prevent Smoke and Save Coal

Boiler Room Instruments Help Save Fuel— Suggestions for Fuel Economy

JUST now every practical suggestion along the lines of fuel conservation is a matter, not only of personal comfort but what is vastly more important, of the national welfare. Naturally the best place to save coal is the place where it is being used, and the boiler room offers a fruitful field for the exercise of fuel economy. The following summary of the experience of the combustion engineers of the Westinghouse Electric & Manufacturing Company, as gained from their own experiments and their observations of practical operation in customers' boiler rooms, will therefore be of value.

The formation of smoke, which contains much unconsumed fuel, should be prevented by proper firing methods and the flue gases should contain from 10 to 12 per cent of CO₂. Fires should be kept free from holes, and the fuel should be so distributed over the grate as to prevent the influx of excess air which accompanies thin fires and the incomplete combustion resulting from ex-

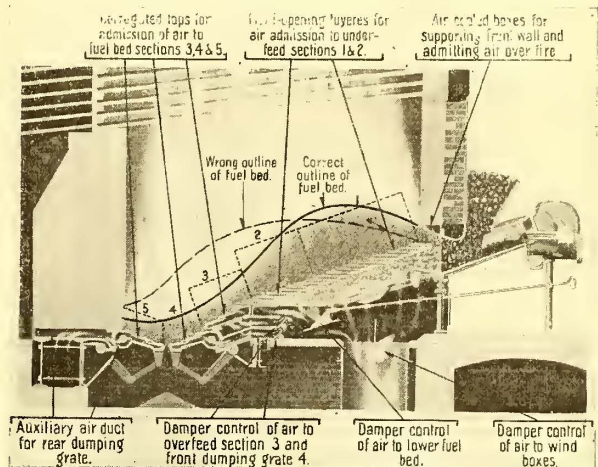
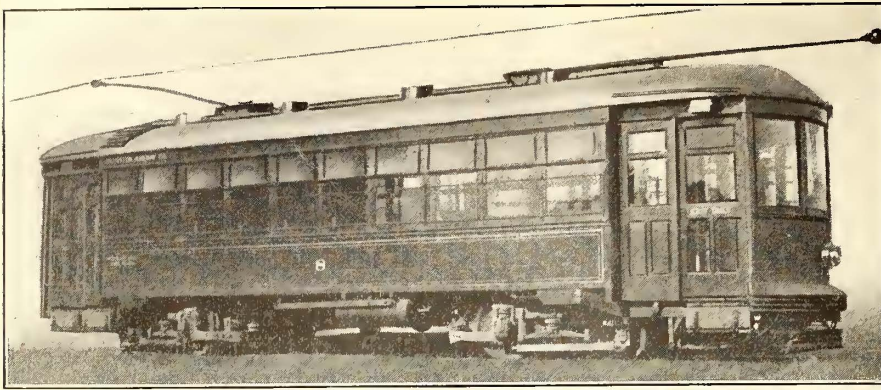


DIAGRAM SHOWING CORRECT AND INCORRECT OUTLINES OF FUEL BED ON BOILER FURNACE GRATE

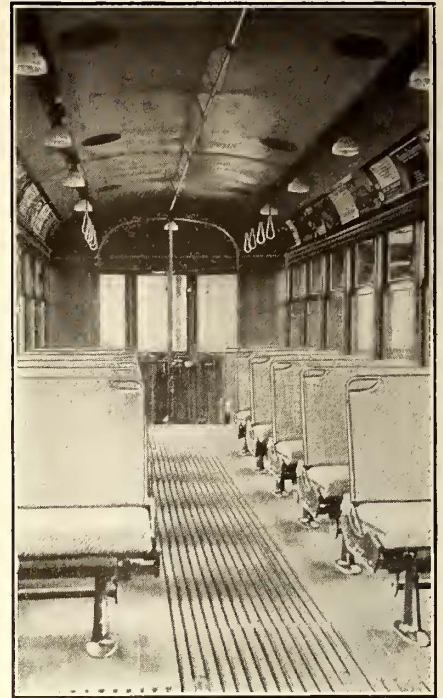
cessive thickness of fires. The proper fuel distribution for a given type of stoker is illustrated in the accompanying figure.

Gages which indicate boiler operating conditions should constitute a part of the equipment of every boiler room. As a minimum, the instrument equipment should consist of draft gages connected with the furnace above the fuel bed and on the boiler side of the flue damper, and a steam flow meter for each boiler. Gages and dampers should be conveniently located, otherwise they will not be used.

The loss due to the presence of unburned fuel in the ash should be avoided, boiler settings should be kept air-tight and baffles in proper condition, and under no condition should live steam leaks be tolerated. Exhaust steam should be used in place of live steam for auxiliary purposes wherever practicable. All steam pipes should be insulated and the tubes kept free from soot and scale. The size of the coal has much to do with the capacity and efficiency of a boiler. In general, the air pressure penetrates a fuel bed formed of coarse fuel more readily than one formed of finer coal, producing greater disturbance of furnace conditions and lowered boiler efficiency.



FOUR-YEAR-OLD CAR WHICH HAS MADE 180,000 MILES



INTERIOR OF EVANSTON CAR

Efficient and Systematic Maintenance Prolongs Life of Rolling Stock and Reduces Operating Costs

Evanston Railway Cuts Power Costs Over 20 per Cent by Careful Inspection and Increases Fare Collections an Equal Amount by Efficient Maintenance

THE Evanston (Ill.) Railway, operating 10 miles of city track and thirteen cars, took over this property in 1913. The system at that time consisted of eight rented cars and approximately the same track mileage as at present. Fate had not been kind to the predecessor and the cars were on the order of the famous "Camel Backs," with the track in a similar condition of deterioration.

As the first step in the rejuvenation thirteen new cars were purchased from the St. Louis Car Company and delivered in 1914. Much of the track was rebuilt and repaved and the balance was rehabilitated by the use of new ties, an Indianapolis welder and a grinder, so that it would last for a few years longer. The entire track was Lorain welded.

The cars to date have made approximately 180,000 miles apiece, operating about 200 miles per day per car at a speed varying from 11 to 12 m.p.h., and with a haul of about 1400 passengers per car per day. This rolling stock to-day has every appearance of new equipment, as is indicated in accompanying illustrations. The company has had practically no motor trouble and an axle failure has never been known. In spite of rising costs, operating expenses have been maintained at normal and

many items have been materially reduced. The secret behind this rather exceptional record is chiefly tied up in the one word—efficiency. Some of the methods of maintenance followed at Evanston may interest other roads of similar size which are fighting rapid depreciation because of lack of funds to be used in maintenance.

INSPECTION AND REPAIR GIVE MAXIMUM SERVICE

On Jan. 1, a thorough overhauling of rolling stock begins. Shall we follow one car through the process to see what happens? First, the car is given a thorough washing on the outside. It is then run into the shop and jacked up, the trucks are run into the repair bay and the motors are taken out for a thorough cleaning. Armatures are turned and slotted and painted with P. and B. paint, and journal boxes are packed. In the meantime the inside of the car receives a good scrubbing from the roof to the floor. The cane seat backs and seats are removed from the car, scrubbed and allowed to dry for four or five days, when they are varnished with a quick-drying flexible varnish intended to last one year. The trucks are scrubbed, all bolts inspected and tightened and then the trucks are painted. Before the car is placed back on the trucks, all iron and steel of the

Date	Repair Work	Repair Motor Bearings	Repair Arm Bearings	Oil Journal Bearings	Oil Arm Bearings	Oil Motor Bearings	Oil Air Compressor	Oil Air Valves	Oil Doors	Oil Truck Wheels	Small W. T. Slur Oil	Trucks in Car Body	Oil Lub. Brake Shoe	Oil End Brake Shoe	Repair Truck No.	Repair Truck No.	Change Wheel	Motor Number	Motor Number	Car Washed Outside	Car Washed Inside	Trucks Cleaned	Trucks Report Red	Trucks Report Green
1																								1
2																								2
3																								3
4																								4
5																								5
6																								6
27																								27
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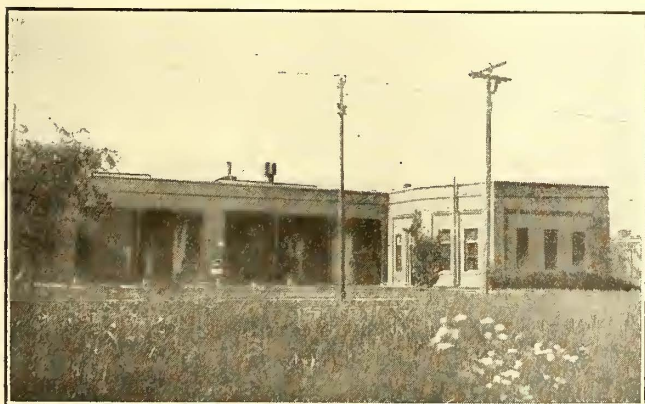
FIG. 1—INDIVIDUAL CAR TROUBLE REPORT SHEET

underframe is gone over with a wire brush and painted. The car body is then varnished and the floors oiled. The Evanston company is convinced that the oiling of floors on its property has demonstrated beyond all question of doubt the advantage of this method as compared with the old method of painting. This constitutes the annual inspection and repair. In addition to this the air brakes and the control equipment are inspected for every 400 miles of operation, which is normally a two days' run. The motors are blown out with air every four months and the floors are oiled every four months. The cars are washed periodically, depending upon the weather conditions.

About May 1, the Peter Smith stoves are removed and overhauled. New grates are installed if necessary, broken parts are welded with the oxy-acetylene torch and the stoves are painted and stored away to be installed in the fall on a moment's notice. Storm sashes come off about April 1. These are cleaned, varnished and stored away to be put on with the first cold weather. A temperature of 65 deg. is maintained in the cars throughout the winter season.

TROUBLE REPORTS VALUABLE

Every crew makes out a daily report of troubles on a sheet similar to that shown in Fig. 2 or O. K.'s the report. This report is printed in green, but one of exactly the same form printed in red signifies that the trainman considers the trouble to be of so serious a nature that the car is not fit for operation until repaired. The main feature of this report is that each trouble listed has a number. The master mechanic enters the car report by numbers on a large sheet like that shown in Fig. 1 each morning. A page like this is kept for each car. A work order similar to Fig. 3 is made from the regular inspection report entry and the trouble report. Thus everything is recorded by numbers. This



SHOPS AND OFFICE OF THE EVANSTON RAILWAYS

saves time in making the reports and makes it easy to note at a glance what troubles predominate. When the work is done it is checked off and the order is filed for record.

Another item which has helped to reduce the cost of operation has been foresight in the purchase of materials. The order for a recent month to keep the stock replenished consisted of the following:

- Fifty 1-in. x 6-in. machine bolts,
- Fifty 1-in. x 5-in. machine bolts,
- Thirty segments No. 143751,
- Twenty-five 1/2-in. x 3 1/2-in. lag screws,
- Fifty K-51 lock trigger controller fingers,
- One dozen brooms,

a total amount of less than \$40. This was made possible because supplies were stocked up two or three years ago when prices were lower. Fuel for the season is bought, stored and paid for in April of each year.

POWER COSTS REDUCED 24 PER CENT—FARE COLLECTIONS INCREASED 20 PER CENT

An example of what has been done in the way of reducing certain operating costs since the road was taken over by the present management is shown by the

Evanston Railway Company
TRAINMAN'S REPORT

Date 191

Trainman must report on the form the condition of their car after each run with an X opposite defects to be corrected. If the defects can not be located, explain how the car acts. If you consider the car not fit for operation, see report printed in red; if car reported O. K., use report printed in green. Report must be made for each car handled during the day, signed by conductor and motorman.

CAR No.

MOTORS

1. Motor dead
2. Motor leads
3. Hot motor
4. Flash over

CONTROLLERS

5. Arcing in controller
6. Controller burned out
7. Controller finger

72. Trap doors

73. Ventilator broken

74. Car body, acc. accident

Signed: Conductor

Signed: Motorman

Evanston Railway Company
Employee's Work Order

CAR NO DATE 191

Employee No will perform the duties indicated below by an X, and return this slip to the Master Mechanic properly signed.

Repack Journals

 " Axle Bearings

 " Armature Bearings

Oil Journal Bearings

 " Axle

 " Armature "

 " Sanders

 " Fenders

W. T. Brake Shoes on Axle No.

W. T. Brake Shoes off Axle No.

Thorough Inspection Car Body

Change Brake Shoes on Axle No.

New Journal Bruses on Axle No.

Repair Trouble No.

Signed

FIG. 2—TROUBLES NUMBERED ON REPORT USED AT EVANSTON. FIG. 3—WORK ORDER FOR REPAIR OF ROLLING STOCK

amounts paid for power. More cars are operated, more passengers hauled and better schedules maintained, and yet, through careful semi-annual inspection of the overhead and the transmission lines, the amount was decreased from \$27,537.34 for the year 1912-1913 by the former company to \$20,808.73 for the year 1913-1914 by the present company. This amount has increased gradually to \$22,055.02 for the year 1917-1918.

Careful supervision in the collection of children's fares has increased the number from approximately 3000 per month by the old company to 15,000 per month at present. Mail carriers, who formerly rode free at all times, are now permitted this privilege only when in the performance of their duties. The government stood back of this action and advised the company that it could tell when a carrier was on duty as he must then always carry his bag and was not allowed to carry it at any other time. Free rides have thus been reduced by about 15,000 per year.

The wage scale at Evanston is said to have been among the highest in the country for a town of its size. The company enjoys the most congenial relations with the public and fare collections have been increased approximately 20 per cent, due not to an increase in population but to the clean and well-kept rolling stock and the public attitude. In the words of General Manager Speed, "It is the difference between what a company is entitled to receive for its service and what it gets through thoughtless operation, together with the difference between what its expenses should be and what they really are, that makes a company prosperous or otherwise. In other words, it is the petty details that make or break."

How Many Units Should There Be in the Substation?

Advantage of Many Small Units to Follow Load Closely May Be Offset by Higher Cost and Switchboard Apparatus Needed

BY G. H. MCKELWAY

Engineer of Distribution Brooklyn (N. Y.) Rapid Transit System

IN THE April 15 issue of the *ELECTRIC RAILWAY JOURNAL* there was an article entitled "Designing and Operating the Substation for Maximum Efficiency," which describes the Cedar Avenue substation of the Cleveland (Ohio) Railway. The writer of the article is to be congratulated upon the fact that instead of merely describing the general features of the substation, he endeavored to show why the substation was constructed as it was and gave the reasons for departing from what might be considered normal practice.

I am not sufficiently familiar with the prices and efficiency curves of 60-cycle railway substation apparatus to check the statements with any accuracy but I would like to issue a warning against the use of similar arguments in favor of the installation of a large number of comparatively small machines rather than a few large ones, where 25 cycles are employed.

The station in question had a capacity of 12,000 kw. and was built to contain eight 1500-kw. machines. The reasons for installing the 1500-kw. size instead of perhaps four 3000-kw. rotaries were as follows:

1. Better economy could be secured by putting in a large number of small units and cutting them in and out to follow the load as closely as possible.

2. The rotaries and other apparatus used were standard with other apparatus on the system so that an operator requires no breaking in when transferred from one station to another.

3. If one of the eight units is out of commission the others have to carry only 14 per cent overload as against 33 per cent on the other three machines, if one of four rotaries should be lost.

In support of these arguments the following statements were made:

(a) The efficiency of the 1500-kw. unit is practically as high as that of the 3000-kw. unit.

(b) The cost of the two 1500-kw. machines is not much, if any, higher than that of one 3000-kw. machine.

(c) The slightly larger building required for eight of the smaller rotaries was not a factor for consideration as the length of the building was practically controlled by the number of feeder panels necessary.

Now let us look into the merits of the arguments:

1. The efficiency curves of recently designed 3000-kw. 25-cycle rotaries, with static transformers, are practically flat between the limits of two-thirds load and 50 per cent overload, and within these limits the efficiencies are as high as those of 1500-kw. machines working at rated load. It is, therefore, only at times when the load on the station drops to from 3500 kw. to 4000 kw., and when it is below 2000 kw. that there is any advantage in using the smaller machines. If it is desired to follow the load closely at those times it can be done just as well by the use of three 3000-kw. and two 1500-kw. rotaries as if all of the machines were of the smaller size. At the same time advantage can

be taken of the higher efficiency of the large machines whenever the load is heavy enough to warrant the running of one, or more than one, of them. The writer has had some experience with a station equipped with one small and several large machines and no station on the system could keep its rotary capacity closer to the actual load than this one, the small machine being the one most used in the entire station.

2. The argument for standardization of all rotaries is a good one. If two sizes of machines were used they would be handled in the same way, the differences if any being so slight as to be entirely unimportant and less than are often found between machines of the same size and general type but differing by a few years in age. What is more important is that two sets of repair parts would have to be carried instead of one. This, while a slight disadvantage, should be greatly outweighed by the advantages dependent upon the use of the larger machines.

3. There is no escaping the fact that with a large number of rotaries the loss of one would overload the others less than if a smaller number were in service. If the load factor of the station were nearly unity this argument would have much greater force than is the case with the usual city railway where there are two marked peaks, one in the morning and the other at night, corresponding with the rush hours. These peaks, while they may extend over a period of perhaps two hours each, are much shorter when the duration of the tip of the peak is considered, that is, the time when the maximum load is on the station. For this reason, even with one rotary out of service, the others may be overloaded for only one hour or even less, and the extreme overload will probably be carried for only fifteen minutes to a half hour. The modern 25-cycle machines are made to carry a 50-per cent overload for two hours without overheating, and for a short time will carry 100 per cent overload without ill effects. Therefore the increase in load which would have to be carried by the remaining large machines, if one of them should be damaged, is of comparatively small importance.

So far as the three statements, used to back up the arguments, are concerned, (a) dealing with the efficiency of the machines is answered in the reply to argument No. 1.

(b) A recent quotation on both 1500- and 3000-kw. machines leads the writer to believe that the single larger rotary would cost approximately \$2,000 less than two of the smaller type. Therefore if the equipment of the station were made up of three 3000-kw. and two 1500-kw. machines the cost of the rotaries alone would be about \$6,000 less than if eight 1500-kw. machines were purchased. In addition to this there would be a saving on the static transformers, while the smaller number of machines would make unnecessary the purchase of considerable switchboard equipment, both high and low tension. This switchboard material is expensive and the saving occasioned by its being unnecessary to purchase so much of it would add considerably to the amount to be saved on the rotary and static transformers.

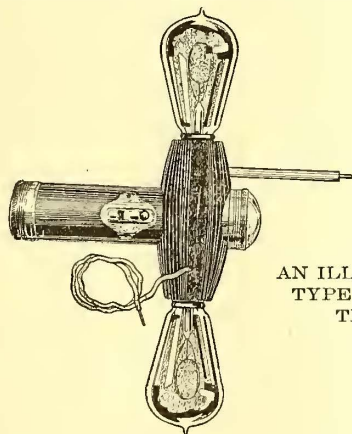
The last statement, (c), is to the effect that the size and, therefore, the cost of the building could not be reduced even if the larger machines were used because the switchboard determined its length. The

writer evidently did not take into account the fact that, while the number of feeder panels would be unchanged, yet he would save three a.c. and three d.c. machine panels which would presumably shorten the length of the switchboard by 12 ft. A still further reduction in the length of the building could be made by placing the switchboard closer to the end wall of the building and by placing the large door in the end instead of the side wall. By these means the building could be shortened to 90 ft. or 100 ft., instead of an average length of 135 ft. The cost of the building would be approximately in proportion to its size and if that were reduced to two-thirds of the size needed for eight machines there would be a saving of about one-third of the cost of the structure, not including the basement. As the building shown in the plans would cost at least \$30,000, it is safe to say that from \$8,000 to \$10,000 could be saved on the building alone. Add this amount to the saving due to the use of fewer large rotaries and their transformers and to the amount to be saved in switchboard panels, high-tension switches, etc., and the total will be at least \$20,000 in first cost as well as a smaller maintenance cost due to the higher efficiency of the machines and the smaller number of them to be taken care of.

Device for Testing Fuses in Service

WHEN a car is in service and trouble of a nature that would indicate an open circuit occurs, the first thing an inspector does is to examine the fuses in that particular circuit. When the time is short, these are usually replaced with new fuses and those removed are kept to be tested in the shop at some future opportunity. This method requires an additional stock of spare fuses above the normal requirement.

A device designed to facilitate the detection of blown



AN ILLUMINATED TYPE OF FUSE TESTER

fuses and provide a quick means of testing them in service is being marketed by E. S. Blake, 230 South La Salle Street, Chicago.

The device consists of a dry-cell flashlamp on which are mounted two contacts and two test lamps for testing the fuses. The flashlamp provides light where it is necessary to make the test at night or in dark places. Connections are made across the fuse contacts by means of two contact points connected to the test lamps. In making tests on 500-volt circuits, it is necessary to use two 220-volt lamps connected in series. The device is made also without the flashlamp for the convenience of electricians having their own lamps.

A Universal Bearing Chuck that Saves Time and Labor

By J. W. STRAWBRIDGE

Master Mechanic Williamsport (Pa.) Passenger Railway

IN THE accompanying illustration are shown the details of a chuck and ring for holding motor bearings while they are being bored in a lathe. We have found that the use of such a chuck saves much time and labor and also insures accuracy in the boring of the bearings.

The chuck shown in Fig. 1 is of cast iron. It has a

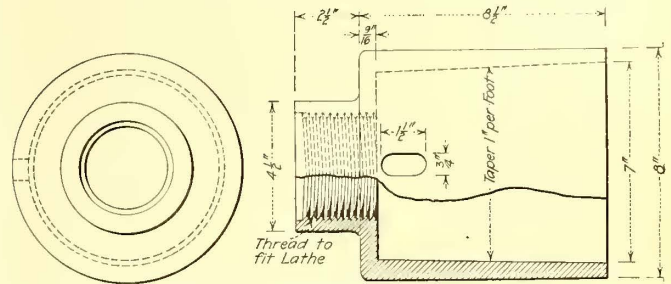


FIG. 1—BEARING CHUCK USED IN THE SHOPS OF THE WILLIAMSPORT PASSENGER RAILWAY

hub at one end, and is bored out and threaded so that it can be screwed onto the spindle of the lathe when the lathe chuck is removed. The larger end of this chuck is bored to a taper of about 1 in. per foot.

The bearing to be machined is centered and clamped by the split bushing shown in Fig. 2. This type of split bushing was described in the issue of the *ELECTRIC RAILWAY JOURNAL* for June 2, 1917, page 1015. These split bushings are made of cast iron and have the inside bored out so that they will just slip over the motor bearing. The outside of the bushing is turned to a taper corresponding to the inside of the chuck shown in Fig. 1. After the machine work on the bushing has been completed, it is cut through with a hacksaw for its entire length. Where several bearings of different diameters are to be machined the bore of the split bushings is made to fit the different size bearings while the outside has the same diameter and taper necessary to fit the chuck.

In preparing a bearing for machining, it is inserted in the split bushing which is then shoved into the chuck. Owing to the large surface in contact between the bushing and the chuck, it is only necessary to shove this in

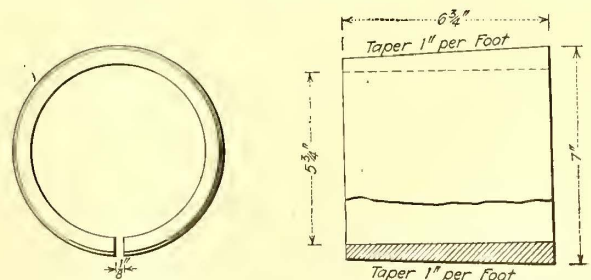


FIG. 2—SPLIT BUSHING USED TO CLAMP BEARING INTO THE UNIVERSAL CHUCK

with the hand to secure it properly. A slot is cut in the chuck at the hub end, and to remove the bearing a drift should be inserted through this slot. A slight tap on the drift is sufficient to remove the bearing.

Transfer Relay Used to Energize Circuit-Breaker Trip Coil

PROTECTIVE relays that operate by closing a separate direct-current tripping circuit which in turn trips the circuit breaker have come into very general use. In some cases, however, a separate direct-current tripping circuit is not available and "transfer"

relays are used to provide for energizing the trip coil of the circuit breaker through current transformers. The Westinghouse Electric & Manufacturing Company has placed on the market the type BT relay which can be applied to any make of circuit-closing relay similar to its CO or CR relay. The breaker operates solely through the current transformer and the relays. When there is no fault on the line, the trip coil of the breaker is mechanically and electrically isolated from the circuit, avoiding possibility of tripping due to imperfection in the relay contacts ordinarily shunting the trip coil.

The type BT transfer relay contains two series coils, an upper or operating coil and a lower or holding coil. The holding coil holds down the armature core, until a third coil, wound on the same magnetic circuit and known as the releasing coil, is short-circuited by the protective relay. The releasing coil acts as the secondary of a transformer, and when short-circuited a current flows through it, demagnetizing the core. The holding coil, therefore, allows the operating coil to raise the core which operates the transfer switch, thus closing the trip coil circuit.

The transfer switch and other current-carrying parts of the relay are designed to carry 5 amp. continuously, but during times of short-circuit the switch may be called on to handle as much as 100 or 200 amp.

A current transformer must be selected of sufficient capacity to operate the protective relay, the transfer relay and the trip coil. Low-ratio bushing-type current transformers sometimes used on high-voltage circuit breakers are not suitable.

Only one trip coil is required for use on a polyphase circuit, but if the breaker is equipped with as many trip coils as there are relays, it is advisable to connect each trip coil to its corresponding relay.

Some Data on Heavy Oil Engine Operation

IN A RECENT publication of the Bureau of Mines on the subject of the Diesel engine some interesting data are given as to the cost of generating electrical energy by means of this prime mover. A statement is made that a small plant having a fluctuating load with a yearly output of 1,250,000 kw.-hr. was supplied by a 500-kw. steam turbine, operating condensing, and consuming about 6½ lb. of coal per kilowatt-hour. By the installation of a 200-kw. Diesel engine unit, at a cost of \$30,000, a yearly fuel saving of \$11,000 could have been realized. The coal in this case was expensive,

costing nearly 20 cents per 1,000,000 B.t.u. Variable-speed Diesel engines coupled to generators and built into passenger railway cars have, it is stated, been used in several instances in Europe with great success. The fuel consumption varied from 0.8 lb. to 1.2 lb. per train-mile with a train weight of 30 to 66 tons. The average fuel consumption was from 2 to 2¾ lb. per 100 ton-miles. On a basis of 1 kw.-hr. being generated with a fuel consumption of 0.7 lb. of oil this equals in round numbers 3 to 4 kw.-hr. per 100 ton-miles, or 30 to 40 watt-hours per ton-mile.

New Haven Installs Lead-Covered Cable for Dispatching Circuits

THE officials of the New York, New Haven & Hartford Railroad decided to use lead-covered cable for their dispatching circuits in an attempt to prevent interruptions to service previously occasioned by sleet storms, wind storms and other disturbances that spell ruin to open-wire overhead construction.

The New Haven installation is particularly interesting owing to the electrical and construction difficulties encountered. It extends from the Mott Haven yards in New York, a distance of 70 miles to the New Haven end. As it follows the right-of-way, it parallels the high-tension line over which power is transmitted, at 11,000 volts, single phase.

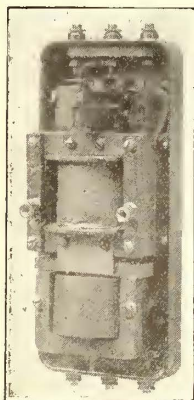
Much of the right-of-way is through rock formations, making underground construction prohibitively expensive. On such parts of the line, the cable is put on short, heavy, storm-resistant poles. At crossings and at points where the high-tension leads are in close proximity, concrete-encased duct is used. Where conditions permit at other places, the cable is put underground.

The cable, furnished by the Western Electric Company, is of the latest design paper-insulated duplex type containing one pair of No. 10 B. & S. gage conductors, six "quads" of No. 13 and sixteen "quads" of No. 16. Special insulation provides ample protection between pairs and between core and sheath.

All train dispatching is to be over this cable by telephone in conjunction with a complete equipment of Western Electric alternating current selectors. All other wire traffic will also go through this cable, the large conductors of which will be used for through service between New York and Boston. By arrangement with the American Telephone & Telegraph Company, the cable will be "loaded" to provide proper transmission facilities for permitting long distance connections with other points.

The details of construction have been worked out under the direction of N. E. Smith, superintendent of telegraph, and H. A. Shephard, assistant superintendent. Both are personally supervising the details of installation. The construction work is being done by Gibbs & Hill, consulting engineers, New York City.

The Aberdeen (Scotland) Corporation Tramways proposes to extend its present facilities for carrying parcels to include the delivery of bread and meat from shops by means of messengers who would leave the cars at certain points.



TRANSFER RELAY, COVER REMOVED.

Recent Happenings in Great Britain

Women in London Strike for the Same Pay as Men—\$750,000 Fire Destroys Equipment—Several Important Construction Developments

(From Our Regular Correspondent)

As the result of a strike, the omnibus services of London were practically at a standstill for nearly a week recently. Several of the tramway services in the outer districts were also suspended. The strike originated in a demand by the women workers for the 5s. additional "war wage" recently given to male employees doing similar work. At the end of June last an application for increased wages to tramway and omnibus employees was referred to the committee on production, which awarded an additional wage of 5s. a week, making a total war advance of 25s. a week. The women were not included in this as the committee held they had not established the same claim to it. The award was unsatisfactory to the women workers and a strike was commenced by the conductresses on certain of the London tramway systems and several of the bus routes refusing to work except on terms of equal pay for work like the men's. The trouble spread rapidly, with the result that in a short time practically all the bus services of the metropolis were idle. The inconvenience to the public may be gathered from the fact that the buses carry an average of about 2,000,000 passengers daily. The London County Council Tramway service and the tubes and underground railways were not affected to any extent and the crowding of these systems by the people ordinarily employing other means of transit created great congestion. Work was resumed as the result of negotiations between the employees and the Ministry of Labor and the matter was again referred to the committee on production. That committee has now issued its award, as follows:

1. To those grades of women, aged eighteen years and over, whose terms of employment include an undertaking that they shall be paid the same rates as the grades of men whose places they have filled, there shall be paid such advance as shall give 25s. a week over the pre-war rates of the grades concerned, payment to be made on the basis of a week of six days or six shifts.

2. In the case of women, aged eighteen years or over, not covered by the above clause, the advances now being paid shall be increased by 5s. a week, subject to a maximum of 25s. a week over the pre-war rates of the grades concerned, payment to be made on the basis of a week of six days or six shifts.

3. The increases hereby awarded shall take effect as from the beginning of the first full pay following July 9, 1918. They are to be regarded as war wages, and recognized as due to and dependent on the existence of the ab-

normal conditions now prevailing in consequence of the war.

The committee recommends that the whole question of women's wages and advances should be made the subject of a special inquiry, and a notice has been issued stating that the government has decided to appoint a committee "to investigate and report as to the relations which should be maintained between the wages of women and men, having regard to the interests of both, as well as to the value of their work. The recommendations should have in view the necessity of output during the war and the progress and well-being of industry in the future."

Following the omnibus and tramway strike in London, a partial stoppage of work took place on some of the tube railways, due to a section of the employees of the Underground Electric Railways, London, going out on strike. In this case also the demand was for equal pay to women and to men for equal work. After two or three days the strikers returned to work on the advice of the union officials and negotiations have been entered into for a settlement of the points at issue.

The London General Omnibus Company is about to introduce on selected routes twenty double-deck gas-driven omnibuses. The scarcity and the high price of petrol have led the company to make a series of investigations with the object of finding an efficient substitute, and the conclusion arrived at is that coal gas is the only satisfactory alternative fuel available. The method of carrying on the roof of the vehicle a large bag inflated with gas, as was done in the case of a number of commercial motor vehicles, was not applicable to double-deck omnibuses. Instead, the vehicles have been equipped with wire-wound metal cylinders to hold compressed gas. The cylinders are placed out of sight under the longitudinal seats of the lower deck. The gas-equipped vehicles present practically the same external features as the ordinary petrol-driven omnibuses. As regards running expense, it is stated that including charges for compressing the equivalent in gas of 1 gal. of petrol, the cost is 1s. as against approximately 3s. for oil.

One of the most destructive fires which have occurred on Tyneside for many years broke out recently at the electric train sheds of the North-Eastern Railway at Heaton, Newcastle. Thirty-eight electric coaches and the sheds, which covered 5 acres of ground, were completely destroyed. The damage is estimated at £150,000. Electric train traffic from Newcastle to the sea coast is very heavy and there were

more than ninety coaches in the sheds when the fire was discovered about 7 o'clock in the morning. It was not until midday that the fire was under complete control. Fifty-three coaches were taken out undamaged. In order to meet the needs of passengers to the coast steam trains have been utilized to supplement the electric service.

With the object of reducing the consumption of electricity, the number of usual stopping places on the Keighley Tramways has been reduced by about one-third. At present two of the three trackless car routes are not in use owing to the inability of the tramways department to get motors repaired, and it is likely if the necessary 15 per cent reduction in current is not secured by the reduction of the number of tramway stopping places that the remaining trackless car service may be stopped.

A linking-up of Sheffield and Chesterfield—12 miles—by tramcar is being arranged, the Sheffield Corporation having entered into an agreement with the Chesterfield Rural Council to construct a tramway to Dronfield.

It has been decided to discontinue the Sunday service of tramcars in Huddersfield so long as the present restriction on coal continues.

In view of the necessity for exercising economy in regard to the consumption of electrical energy, the Wallasey tramway committee is reducing the number of stopping places and is granting a bonus to motormen for the saving of current. It is also proposed that the cars stop half an hour earlier.

A conference of representatives of publicly owned electric undertakings on the North-East Coast was held at Newcastle recently to consider the report of the government committee, which recommends the creation of a number of super-power plants in various parts of the country. The feeling of the meeting was strongly opposed to the idea of such plants being in private hands, and it was suggested that representations should be made to the government in favor of the proposed plants being controlled by a public electricity board. The conference was adjourned without any definite decision being arrived at.

A scheme is being promoted by the Dublin and Lucan Electric Railway to utilize the Salmon Leap Falls on the River Liffey in Ireland for the generation of electrical energy. The main feature of the plans is an increase in the present fall of 17 ft. to 40 ft. The estimated cost is £50,000, and it is proposed that the entire capital expenditure shall be borne by the government. It is stated that the scheme should save more than 16,000 tons of coal a year.

The Birmingham Corporation has adopted the amended scheme for the permanent generating station at Nechells, for the mains and substation equipment and for a linking-up main between Nechells Station and the Smethwick boundary. The estimated cost of the work is £1,626,140. A. C. S.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Staggered Hours Win

Fear of Spanish Influenza Accelerates Adoption for Government Employees in Washington

The plan for staggering the hours of Washington car riders, submitted by John A. Beeler to the Public Utilities Commission of the District of Columbia on March 22, 1918 (ELECTRIC RAILWAY JOURNAL on April 6, page 655), went into effect in large measure on Oct. 3. The details of the plan had been under consideration for some time, but it did not become effective for one reason or another until the ravages of Spanish influenza made it desirable to reduce street car crowding immediately as much as practicable.

The following table shows the old and new opening hours of the principal interests affected:

	Employees
Agriculture, from 9 to 8.30 a.m....	3,243
Commerce, 8.45 to 8.30 a.m.....	625
Bureau of Engraving, 8 to 7.30 a.m.	7,400
Interior, 8.45 to 8.30 a.m.....	2,300
Labor, 9 to 8 a.m.....	500
Patent Office, 9 to 8.30 a.m.....	1,000
Pension Office, 9 to 9.30 a.m.....	1,000
Post Office, 9 to 8.30 a.m.....	1,800
Treasury, 9 to 9.30 a.m.....	2,900
Int. Com. Commission, 9 to 9.30 a.m.	1,000
Railroad Administration, 9 to 9.30 a.m.	1,000
Business houses, 9 to 10 a.m.....	15,000

Changed hours for the War Risk Bureau, now employing 11,000 people, are also under consideration. Washington stores have been ordered not to open before 10 a. m., and no employees of such stores save those in freight and shipping departments may report before 9.50 a. m. Chairman Brownlow of the District Commission has taken up also with the Merchants and Manufacturers Association and store people generally the matter of opening stores at 10 a. m. and closing them at 6 p. m. The only exception would be such stores for groceries, meat and other food.

This really startling adoption of the staggered hour is due in large measure to the quick wit of the commission which impressed Surgeon-General Blue and Secretary McAdoo, who has the Public Health Service under his jurisdiction, that this method of thinning out electric railway travel would be an excellent precaution against the spread of Spanish influenza.

The half-hour peak in Washington has now been spread over two hours, and the crowding has been greatly decreased. The only obstacle to perfection is the sick list of two hundred car operators.

Let the City Try It

Colonel Kealy Offers Kansas Lines of His Company to City for Six Per Cent Guaranteed Return

The Kansas City (Mo.) Railways has met squarely the issues raised by the officials of Kansas City, Kan., over service, fares and wages. After numerous published interviews with city officials and two mass meetings at which public ownership was discussed, P. J. Kealy, president of the company, sent a letter to Mayor Harry A. Mendenhall of Kansas City, Kan., offering to turn over the electric railway property to the city, the only condition being the payment by the city of 6 per cent interest on the capital investment of the company.

The wages of employees on the Missouri side were increased, as the company promised, when the Missouri Public Service Commission granted the 6-cent fare for the lines in Missouri. There has been no such fare advance on the Kansas side, and consequently no means of paying increased wages except from the savings arising from the suspension of service on one of the Kansas lines. On Sept. 24, however,

You Don't Always See the Target

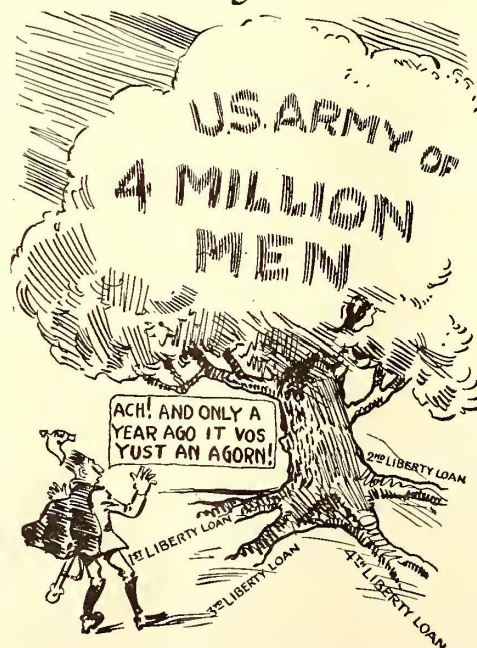
AN ARTILLERYMAN works behind the fighting line. Often his gun is parked in some quiet field where the birds sing and there is no indication of warfare.

Over a telephone comes the small voice that gives him the range and orders him to fire.

The breech block is swung open, a shell pops into the big bore, the block closes greedily upon it, the engine is discharged. With a roar of exploding gases the big shell whines along, rising high in a great arc that drops it miles beyond the gunner's horizon.

THE fire continues with a steady rhythm of work—the block opens, the shell slides home, the breech closes and the gun is discharged over and over again. The artilleryman, sweating, blinded with smoke and gases, choked with dust, supplies the mechanism with the mechanical regularity of the stoker of an ocean liner—and sees no more of his work's result than does the fireman.

Except for occasional distant word by telephone or signal the artilleryman sees no more of battle than the man at home who buys a Liberty Bond to supply the big gun with ammunition.



Yet both men are serving to the limit. Without them wars could not be won.

The shell that screams its way beyond the horizon hits the enemy's ammunition dump or breaks his line of supplies, though the artilleryman works on in ignorance of his hit. The Liberty Bond smashes the enemy's morale when its total of billions is known to him—and it buys the rifle that sends a victorious American safely into an opposing trench to capture a new position, though the man at home who bought it never sees more than the dotted line where he signed his application blank and the engraved certificate that came in return for his money.

THE artilleryman is a soldier schooled to keep on with his monotonous work regardless of the fact that he cannot see his hits.

Should the man at home, asked to buy more Liberty Bonds, be any less of a soldier because he cannot see the damage caused by his contribution?

We must be a nation of well-trained soldiers, each doing his share faithfully, until this war is done. Then we may all rejoice in the victory our work has brought.

the Kansas Public Utilities Commission directed the company to restore this service.

The letter of Colonel Kealy follows in part:

Contrary to the action of municipal authorities in the majority of the cities of the United States, you have constantly opposed any form of relief which would help meet the expenses of the service demanded. For this reason we have been unable to grant the increase in wages to our Kansas side employees which was given those in Missouri on July 16, 1918. In order to deal justly with these employees and give them an increase commensurate with the increase in the cost of living, it was necessary to discontinue service on the Argentine-Minnesota line. The resulting saving has made it possible to pay the same wages in Kansas as in Missouri.

We are now operating in Kansas City, Kan., at a daily loss of \$1,200. No return on the investment has been paid in more than five years, and the operation of the Kansas lines has not even earned any interest on the bonds for three months. The lines in Kansas have been supported and the service rendered has been made possible by Missouri earnings.

In view of the seriousness of the situa-

tion and in order to guarantee to Kansas City, Kan., the continuation of good street car service at its cost of production, I am empowered to make the following offer through you to the people of Kansas City, Kan.: We will surrender to the city complete control of the electric railway system in Kansas City, Kan. In return, the city is to guarantee a 6 per cent interest return on the capital invested.

If there is any legal or other obstacle to entering into such an arrangement, insuring the carrying out of such plan and adequately protecting the rights of both parties thereunder, then we offer to aid you in removing same. Under this plan the city will be in a position to furnish service at cost and to charge whatever fare is necessary to cover the actual expense of service.

We stand ready to turn over a street railway system which would cost to reproduce much more than its present valuation. We have endeavored to give good service, fulfilling in so doing our legal responsibilities and our moral obligations to the city. If, in public opinion, we have failed, we shall be very glad to be relieved from a thankless task and let public officials assume the management and fix the rate of fare. The matter is extremely urgent and demands prompt action if total and immediate suspension of service is to be prevented.

tate Board was exhibited, declaring that the rent of detached houses had not increased in Kansas City.

The company's exhibits also indicated that food prices in Kansas City are from 3 to 16 per cent below food prices in Eastern cities, and more than 5 per cent lower than food prices over the entire United States.

An elaborate display of vital statistics, collected largely through questionnaires, proved of real value. This exhibit showed that the average family among employees of the company consists of 3.4 persons, and that 68 per cent of married employees have family groups of less than five persons, five being the unit on which estimates are based in cost of living budgets. More than 42 per cent of the employees either own their homes outright or have an equity in real estate, and 33 per cent are living in their own homes. Of 1000 employees selected at random from among the employees, 512 came to the company from farms.

The company also showed that Kansas City Railways employees are now receiving an average annual wage higher than is paid to 51 per cent of steam road employees. Employees of steam roads who in 1915 were getting from 22 to 28 cents an hour are now, since the general advance to railroad employees, getting in no case more than 1½ cents, in most cases less than 1 cent, in excess of the wages paid the electric railway employees. It was mentioned that with the two free uniforms given the electric railway employees, such employees are receiving considerably more than steam road employees. It was also pointed out that steam road employees usually have to ride to their work, while the electric railway employees usually live near their work and do not have to pay car fare.

Kansas Employees' Demands Excessive

Hearing Before War Labor Board Shows Wage Advance of 146 per Cent and Rise in Living Cost of Only 81 per Cent

Representatives of the War Labor Board in Kansas City on Sept. 18 took testimony in regard to higher wages for employees of the Kansas City (Mo.) Railways. The subject came before the board under a joint agreement between the company, the Kansas City Railways Employees' Brotherhood and the Amalgamated Association of Street & Electric Railway Employees. The agreement stipulated that any advance in wages granted should be limited by the financial ability of the company. Part of the evidence, therefore, consisted of the showing by the company of its financial condition.

COULD NOT MEET OPERATING EXPENSES

The men in their petition to the War Labor Board asked for an increase which would add over \$4,000,000 to the present payroll, or \$1,500,000 more than double the present payroll. The increase given in July added \$560,000 to the payroll. Although demanding this enormous increase from the War Labor Board, the union in July in making their demands on the company asked for an increase of approximately \$1,500,000. The company is now facing, on a basis of the 6-cent fare and present wages, a deficit of more than \$900,000 for the year ending June 30, 1919. If the demands of the union were granted, the company would fail to earn its bare, day-to-day operating expenses by \$2,500,000 a year. It would have a deficit under fixed charges of more than \$5,000,000 a year.

The company's tables showed that (using figures of the United States Bureau of Labor Statistics, of the Railroad Wage Commission and from the results of inquiry in the local field) the cost of living has increased 81.63 per cent in Kansas City between 1900 and July of 1918, and that in the same period wages have increased 146 per

cent. This showing is particularly interesting in view of the testimony of employees that living conditions were much better in 1900 than in 1914.

Furthermore, the company showed that the scale of wages adopted in August, 1917, was the result of collective bargaining and therefore represented a response to any advanced standards of living. Since then living costs have advanced 11 per cent, and in July of this year a wage advance of 20 per cent was granted, thus keeping the wages consistently ahead of living costs.

The company had taken much pains to collect for the War Labor Board accurate information on actual living conditions among its employees. One of the exhibits, for instance, contained photographs of homes which employees owned or had equity in—paid for out of wages, and many times at the rate of \$15 a month. There were other photographs of houses rented by employees, at \$15 and \$16 a month. All these were obviously modern homes in good neighborhoods. The company also exhibited copies of *The Railwayman*, the monthly publication formerly issued for the employees, containing many pictures of homes built for or by employees and accompanied by the employees' stories of the purchases.

HOUSING CONDITIONS GOOD

The company went even further and exhibited photographs of modern houses, in good neighborhoods convenient to carhouses, that could be rented at \$15 to \$18 a month. These houses were discovered as available in the "want ad." columns of the daily papers. It was particularly significant that moderate priced homes were available within walking distance even in the high-class residence district adjacent to one south-side carhouse. A statement of the secretary of the Real Es-

Strike On in Buffalo

Unable to meet the demands of its employees for a wage increase because of the restrictions of a 5-cent fare, the International Railway, Buffalo, N. Y., could not prevent a strike of 1800 trainmen on the morning of Oct. 3. The War Labor Board recently granted higher wages contingent upon the adoption of a 6-cent fare. This fare was later voted down at a public referendum, although approved by Council.

At a mass meeting on Oct. 3 in the Chamber of Commerce the business interests of the city agreed to raise a fund of \$75,000 and loan it to the company to meet the wage increases. The trainmen, however, refused to accept the offer because it did not allow them back pay.

No effort is being made by the company to operate cars. All of the International lines are tied up, including the Niagara Falls, Lockport and Olcott interurban divisions and part of the Niagara Gorge route. The Buffalo & Lake Erie Traction Company operating between Buffalo and Erie, is tied up by a strike at the same time.

Cleveland Women Object

Organize to Fight Dismissal From Railway Service by Federal Labor Investigators—Chamber of Commerce and Women's Clubs Ask Rehearing

The women conductors of the Cleveland (Ohio) Railway met on Sept. 24 to formulate plans for asking Secretary of Labor Wilson to reverse the decision of the two federal investigators who recently barred them from their positions after Nov. 1. The decision was noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 28.

The decision of the investigators was not derided, and no fight was made against the union. The women simply insisted upon an opportunity to render patriotic service in releasing men who could perform more important duties in connection with the war.

A formal organization was effected at the meeting, and a general committee was selected to conduct the case. A telegram was sent to Secretary of Labor Wilson, informing him of the first step that had been taken, and a more detailed communication is being prepared for transmission by mail. The women have in preparation 9000 petitions, signed by citizens, asking that they be retained as conductors. It was intended to have them ready for shipment to Secretary Wilson on Oct. 3.

CHAMBER OF COMMERCE PROTESTS

The Chamber of Commerce has interested itself in the finding of the investigators on the broad ground that it is not in line with the policy of the government in urging women to enter industry. In order to place the matter squarely before him, the Chamber on Sept. 27, sent Secretary Wilson a telegram reading in part as follows:

Whether the decision reached by your representatives was justified by the narrow limitations of their field of investigation we do not pretend to know, but we earnestly urge upon your attention that these limitations have produced a ruling that is a source of widespread dissatisfaction to the working people of Cleveland, and particularly to the women in industry; that it tends to discourage women from entering industry on patriotic grounds as well as economic grounds; that it produces a condition of uneasiness and uncertainty on the part of women in industry; that it renders more difficult the labors of other representatives of your department who are seeking to convince manufacturers of the national necessity of diluting labor; that it suggests to particular classes of industry, by inference, the approval of the government of a policy restricting the employment of women so long as men can be employed, and that these general conditions are brought about by reason of the fact that the working people do not understand that the field of your investigators' study was restricted by the nature of the question submitted to them.

The records of your department offer abundant proof of the extreme shortage of man power to meet the national requirements of production in the interests of the United States and her allies. Your records show in detail the situation in the Middle West and form the basis of the urgent representations which your department has made to industry to bring about as speedily as possible the dilution of labor necessary to send and maintain an army abroad.

The Cleveland Chamber of Commerce therefore earnestly urges that you cause as speedily as possible a rehearing of this case on the broad question of policy and of national interest involved in the employment of women by the Cleveland Railway.

We believe an investigation on these broad grounds would lead to a totally

different conclusion from that reached by the previous restricted investigation. Whether or not it produces a different conclusion, it is exceedingly desirable that such an investigation be made at once in order to dispel the disastrous misunderstanding and misinterpretation of the government's policy toward the employment of women in industry which the present decision fosters.

We believe it to be true that the effect of the ruling upon the electric railway service in this city would be extremely serious. Indeed, your investigators admit that the decision would lower the standard of electric railway service. But the purely local application of the decision so completely fades into insignificance that we lay no stress upon this point.

We believe a gross injustice will be done to a large number of women employees of the Cleveland Railway if the decision stands. But, again, we admit that individual injustices are perhaps inseparable from a period of severe industrial stress.

We base our request for a reopening of this question upon its broadest aspects and entirely without regard to the particular interests of the Cleveland Railway, the women employees, or the electric railway men's union, all of whose interests must be made subservient to the paramount interests of the times.

WILSON SAYS QUESTION IS LOCAL

In reply to a telegram that was sent to Secretary Wilson on Sept. 25 by the State Committee on Women and Children in Industry, the following telegram was received on Sept. 28:

There is no question of general policy respecting the work of women involved in the Dielmann-Russanowska decision. All questions of general policy affecting women in industry will be passed upon by the women in industry bureau of the Department of Labor.

There was but one issue submitted, viz.: Is the Cleveland Railway justified in employing women as street car conductors in Cleveland because of shortage of man power? The agents visited the company's employment office and in one day fifty men and twenty-five women sought employment; thirteen men and twenty-three women were permitted to file application papers. Since January the Cleveland employment office has had 13,500 more applications for jobs than the requests of employers; 500 men applied daily for the first three days of each week to the Cleveland employment office for jobs. The street car company has not applied for men to the employment service.

Upon these and similar facts the decision was made. Unless it can be shown that there is error in the information secured or the issue is submitted in a different form, it does not seem that anything would be accomplished by reopening the case.

PUBLIC AND WOMEN NOT CONSIDERED

In discussing the case at a meeting of the women conductors, Miss Rose Moriority, assistant secretary and treasurer of the Champion Stove Company, said that the decision itself indicated that the rights of the two most interested parties had not been considered by the agents at all—first, the rights of the public, and second, the rights of the women conductors. Neither was called upon to furnish any information, and apparently their existence was entirely forgotten in the consideration of the question as to whether the union should or should not dictate the company's course.

Another phase of the situation not mentioned in their decision by the agents, or by Secretary Wilson, is the character of the male applicants. In one day while the investigators were

in Cleveland, Miss Moriority said, eleven of the applicants were men classified by the draft as morally unfit for service in the army, and a number of others almost as bad presented themselves.

A. L. Faulkner, United States commissioner of conciliation for the Cleveland district, has gone to Washington to present to Secretary Wilson affidavits from John J. Stanley, president of the company; George L. Radcliffe, general manager, and A. L. Behner, employment manager, in which they assert that before they employed women they attempted, without avail, to secure male help from the United States employment service.

The women's suffrage organizations and a number of clubs are upholding the women in the fight for their rights, and apparently strong support is rallying to them all the time. It is believed that the labor department will not be able through academic argument to escape reopening the case. It looks as if there would be a demand for recognition of the right of women to work where they chose to work.

A statement, signed by Mrs. Laura Prince, chairman of the women conductors' organization, sets forth the following reasons for asking reconsideration:

1. The decision rendered by the federal investigators was given without any hearing being afforded the women.

2. The investigation proceeded upon the assumption that only two parties were concerned in the controversy; namely, the union men and the Cleveland Railway. Two other important parties should have been considered, the public and the women operators.

3. The interests of the Cleveland public demands that the women now employed as conductors be retained. There are 183 women now operating cars. The interest of the public demands as little change as possible in the service. The discharge of 183 conductors on Nov. 1 will affect the service. The men who displace women must learn their jobs. Very few of these men are more than 45 years old. They will again be displaced as the new draft goes into effect, and early in 1919 a second change is inevitable. This break in the efficiency of the service, admitted by the investigators, is particularly serious in Cleveland, which is the center of munitions manufacture.

4. The women conductors are worthy of some thought. They have left other positions to enter the railway service. Many of them have dependents, owing to the fact that their husbands, sons or brothers have entered the military service. Justice to these women demands that they be retained.

5. The interest of the American public demands not only that the women now in the service be retained, but also that new women be employed upon the street cars. Women act as conductors with ease and efficiency. It is true that men are applying for posi-

tions as conductors, but meanwhile munitions factories and farms are short of men. The men who apply for the conductors' work could get jobs elsewhere, for they can do essential war work which women cannot perform.

Deferred Classification

New York Will Retain Skilled Workmen and Men in Positions Women Cannot Fill

A general expression of opinion in regard to the draft status of electric railway employees in New York City has been given by G. L. Ingraham, chairman of the district board, in reply to a letter from Samuel H. Ordway, member of the Public Service Commission for the First District of New York. The finding, in brief, is that those who are shown to be essential to the maintenance and operation of the railways will receive deferred classification.

Mr. Ordway, after explaining the important war service being carried on by electric railways, said:

"In view of these facts the Public Service Commission is of the opinion that all employees of the subway, elevated and street surface railways in the city who are necessary to efficient and adequate maintenance and operation ought in the public interest to receive deferred classification.

"It seems to us that this classification should include the men actually engaged in both maintenance and operation, including motormen, conductors and guards, platform guards, switchmen, starters, dispatchers and their assistants, tower men, signal maintainers, inspectors, trackmen, skilled mechanics engaged in the maintenance and repair departments and powerhouse employees. In our opinion it is not so essential that this classification should include the ticket agents and ticket choppers at the stations.

In reply Mr. Ingraham said:

"This board has held that these transportation companies are industries essential to the national interests during the war, and that those employees who are essential to the maintenance of these railways should receive deferred classification. In view of the situation as stated in your letter, I have no doubt that the board will grant deferred classifications to all of those who are essential to the management and proper conduct of the train service of these roads, and especially those positions which women are not fitted to fill. This would include, of course, all those workmen who are skilled in the repair of machinery and cars of the system and skilled mechanics in powerhouses.

"It is quite essential in preparing claims for deferred classification that it be shown that the registrant is essential to the maintenance and operation of the railroad, and those who are essential I am satisfied will receive deferred classification. You may take this communication as the general determination of the district board to that effect."

Seattle Sale Being Closed

The city of Seattle, Wash., has engaged Smith, Robertson & Moorehouse of Seattle, certified public accountants, to check the books of the Puget Sound Traction, Light & Power Company prior to closing the deal for the purchase of the system by the city for \$15,000,000. It is expected the firm will have a statement ready in about ten days. Oct. 1, as noted in last week's issue, was the date set for the transfer of the property.

Ford, Bacon & Davis, New York, have notified Mayor Hanson that one of their experts will be sent to Seattle to assist in closing the deal for the purchase of the system. Peter Witt, Cleveland, advised the City Council that he would be unable to come to Seattle to assist in the transfer.

M. E. Sampson, president Seattle & Rainier Valley Railway, is in Seattle to arrange for the sale of this property to the city. Besides the city lines, the property includes a 4-mile interurban to Renton. The Rainier line would give the city an outlet to the south end and relieve the congestion on First Avenue. It also would solve the problem of getting a cross-town line in the south end that would serve a big industrial section now without transportation. Prices have not been discussed, but it is intimated that about \$2,000,000 will be the figure set by the company.

Grand Rapids Men Get 40-46 Cents

Members of the City Commission, sitting as a board of arbitration in the wage dispute between the Railway Employees' Association and the Grand Rapids (Mich.) Railway, have reported the following findings:

Motormen, conductors and motor inspectors to be paid 40 cents an hour for the first three months of service; 43 cents per hour for the next nine months of service, and 46 cents an hour after the first year's service, with no extra pay over schedule for overtime.

The same ratio of increase shall apply to all other employees referred to in the arbitration. The new scale will be dated from Sept. 1, 1918.

A rate of 50 cents an hour with time and a half for overtime was asked by the men. They are now receiving 38 cents an hour for the first six months, 39 cents an hour for the next six months and 40 cents an hour thereafter.

According to the previous arrangement, a signed contract for one year will now be prepared. The new wage rates, it is said, constitute the third increase since Jan. 1, 1918.

With the wage problem settled, the commission will next turn its attention to the question of the 7-cent fare asked by the company. An ordinance granting the requested increase has been placed on its first reading by the commission, and if passed it will be sent to the electors at the Nov. 5 election for ratification.

News Notes

Chicago Wants Engineer.—The West Chicago park commissioners are looking for an electrical and mechanical engineer to take charge of their electric lighting system for more than 30 miles of boulevard and 800 acres of parks and to look after their steam heating plants. The salary is \$3,300 a year.

Detroit Injunction Dissolution Denied.—On Sept. 24 Judge Dingeman in the Circuit Court denied the motion of the Detroit United Railway for a dissolution of the injunction restraining the company from violating the Kronk ordinance. This ordinance forbids a fare higher than 5 cents and orders the company to sell tickets for six for a quarter. Attorneys for the company are now seeking to upset the injunction in the Supreme Court on the ground that these rates are confiscatory.

Twin City Unionists Bob Up.—The War Labor Board has been asked by Minneapolis and St. Paul locals of the Amalgamated Association of Street & Electric Railway Employees of America to consider the situation among employees of the Twin City Rapid Transit Company. The petition demands 60 cents an hour for trainmen, 50 cents an hour for shop and track employees, a basic nine-hour day to be performed in not more than eleven hours, and time and a quarter for overtime. The petition attacks the Minnesota Public Safety Commission and various citizen organizations for their diligence in suppressing disorder during a strike several months ago.

Conciliator Settles Lexington Differences.—Federal Conciliator Hywel Davies has settled the trouble between the Kentucky Traction & Terminal Company, Lexington, Ky., and its employees. The new contract, as accepted by both sides, dates from July 1, 1918, and will continue six months after the signing of the treaty of peace. It provides for a general increase of 5 cents an hour for motormen, conductors and shopmen. The "open shop" principle is to prevail in the selection of employees, with no discrimination against members of the union. Members are to be permitted to wear the union button, and employees will have free transportation for themselves and families. Future differences, when not settled by a conference of the grievance committee and the company officials, are to be submitted to a board of arbitration, composed of a representative of the company and of the association and an umpire selected by the Secretary of Labor. After the settlement the men pledged themselves to invest all back pay in Fourth Liberty Loan bonds.

Financial and Corporate

770,900,000 Passengers a Year Increased Costs and Taxes, However, Cut I. R. T. Operating Income \$2,700,000, or 13 Per Cent

While there was an increase in the number of passengers carried by the Interborough Rapid Transit Company, New York, N. Y., during the year ended June 30, 1918, on both the subway and elevated divisions, as compared with the previous year, the increased costs of labor, materials and taxes more than absorbed the increased income from fares. The number of passengers carried was 770,998,335, as compared with 763,574,085 last year, an increase of 7,424,250, or 0.97 per cent, the result of a gain on the subway division of 4,143,674, or 1 per cent, and a gain on the Manhattan Railway elevated division of 3,280,576, or 0.94 per cent.

The gain on the subway division was the result of an increase of 15,002,257 in passengers carried over new lines in operation and a decrease of 10,858,583 in the traffic over the old subway lines. The increase on the Manhattan division was due principally to the opening of extensions during the year.

The gross operating revenue for the year ended June 30, 1918, increased \$631,581 or 1.58 per cent. This was the result of a gain on the subway division of \$385,555 or 1.80 per cent, and on the Manhattan Railway division of \$246,026 or 1.33 per cent.

OPERATING EXPENSES UP 15 PER CENT

The operating expenses increased \$2,530,043 or 15.25 per cent. Of this \$1,041,579 was on the subway division, caused by an increase of 1,433,721 in car mileage operated, an increase of 1.62 in the number of miles of road operated at the close of the year and the continued tendency to increased cost of labor and materials. On the Manhattan Railway division the increase of \$1,488,463 reflected the continued increase in the cost of labor and materials; operations over extensions, and the increase of 4,043,450 in car-miles operated.

The net operating revenue decreased \$1,898,461 or 8.15 per cent. The loss on the subway division was \$656,024 or 4.92 per cent, and on the Manhattan Railway division \$1,242,436 or 12.49 per cent.

TAXES JUMPED 30 PER CENT

The total amount of taxes represented an increase of \$837,198 or 30.89 per cent. The subway division showed an increase of \$847,900 or 105.79 per cent as the result of an increase in the rate of the federal income tax, the federal capital stock tax and the excess profits tax. The Manhattan Railway di-

vision showed an increase of \$39,298 or 1.90 per cent, the result of an increase in the special franchise and real estate taxes.

As a result of the increased expenses and taxes, the income from operation showed a decrease of \$2,785,659 or 13.65 per cent, the result of a loss on the subway division of \$1,503,924 or 12 per cent, and on the Manhattan Railway division of \$1,281,735 or 16.27 per cent. The non-operating income increased \$34,523 or 6.17 per cent.

\$28,200,000 EXPENDED FOR NEW CONSTRUCTION

The gross income decreased \$2,751,136 or 13.12 per cent, the loss on the subway being \$1,491,987 or 11.46 per cent, and on the Manhattan Railway division \$1,259,149 or 15.38 per cent. Income deductions increased \$1,471,462 or 12.17 per cent. The surplus after dividends of 17½ per cent on the capital stock was \$1,046,267, or \$1,056,387 below that of the previous year.

Additions and betterments were made during the year, including the company's contribution toward the construction and equipment of new lines, to the amount of \$28,267,877.

Three hundred and forty-four additional cars were purchased and placed in service, and all of the Manhattan Railway division motor cars were equipped with trip devices for the pur-

pose of automatically stopping trains should the motorman pass the danger signal.

According to T. P. Shonts, president of the company, an increase in fare is needed, not for the purpose of increasing compensation to the company over that established by the contracts with the city, but to enable the city to meet current deficits. An increased fare would force more than 500,000 or 600,000 non-residents of the city of New York, who use the transportation lines, to bear a portion of the cost; whereas the continuance of the present 5-cent fare would result in increasing the burden upon taxpayers of the city of New York, through an increase of the tax rate to meet the current deficits. Application has been made to the Public Service Commission and the Board of Estimate and Apportionment for an increase.

It is now estimated, says President Shonts, that unless the 5-cent fare is increased the city will face on its total dual subway investment an annual deficit, varying according to the exigencies of the war, of from \$12,000,000 to \$20,000,000. When it is remembered that every \$10,000,000 increase in the tax budget means at least a five-point increase in the tax rate, the advisability of requiring non-residents to pay their just share of the added war costs is impressed.

An increase in fare would not only prevent the accrual against the city, with compound interest, of the company's deficits in failing to earn its preferential, but would place the city in a position to receive immediately an actual return upon its own investment.

COMPARATIVE INCOME STATEMENT OF INTERBOROUGH RAPID TRANSIT COMPANY FOR YEARS ENDED JUNE 30, 1917 AND 1918

	1918		1917	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation.....	\$38,548,910	95.19	\$38,177,195	95.76
Other operating revenue.....	1,948,818	4.81	1,688,951	4.24
Gross operating revenue.....	\$40,497,728	100.00	\$39,866,146	100.00
Maintenance of way and structures—actual.....	\$2,068,686	5.11	\$1,801,474	4.52
Maintenance of equipment—actual.....	2,667,436	6.58	2,121,721	5.32
Total maintenance.....	\$4,736,122	11.69	\$3,923,195	9.84
Maintenance of way and structures—depreciation....	\$95,545	0.23	\$104,030	0.26
Maintenance of equipment—depreciation.....	144,537	0.36	398,144	1.00
Total depreciation.....	\$240,082	0.59	\$502,174	1.26
Total "maintenance" appropriation.....	\$4,976,204	12.28	\$4,425,369	11.10
Traffic expenses.....	174	.....	38	.....
Transportation expenses.....	12,473,087	30.80	10,376,612	26.03
Accidents and damages.....	474,437	1.17	661,023	1.66
General expenses.....	1,189,434	2.94	1,120,251	2.81
Total operating expenses.....	\$19,113,336	47.19	\$16,583,293	41.60
Net operating revenue.....	\$21,384,392	52.81	\$23,282,853	58.40
Non-operating income.....	593,600	1.46	559,076	1.40
Gross income.....	\$21,977,992	54.27	\$23,841,930	59.80
Taxes.....	\$3,758,583	9.28	\$2,871,385	7.20
Interest on bonds—rental.....	4,192,818	10.35	4,183,995	10.50
Manhattan dividends—rental.....	4,200,000	10.37	4,200,000	10.53
Manhattan cash rental.....	35,000	0.09	35,000	0.09
Interest on notes and 5 per cent bonds.....	4,327,177	10.69	3,572,515	8.96
Sinking fund on 5 per cent bonds.....	438,821	1.08	.....	.....
Amortization.....	665	.....	625	.....
Interest on unfunded debt.....	123,315	0.31	37,600	0.09
Other rent deductions.....	199,513	0.49	36,554	0.09
Interest on investment of depreciation reserve.....	39,341	0.10	18,897	0.05
Total deductions.....	\$17,315,232	42.76	\$14,956,571	37.51
Net corporate income.....	\$4,662,759	11.51	\$8,885,359	22.29

Net Earnings Drop 5.5 Per Cent

Comparison of First Half of 1918 and 1917 Shows a Continued Decrease for the Entire Country

Figures compiled by the information bureau of the American Electric Railway Association, covering the first six months of 1917 and 1918, and representing the operation of more than 5000 miles of line distributed throughout the country, reflect the condition that has been long known to prevail in the electric railway industry.

For the entire country operating revenues increased 5.77 per cent, as compared to an increase in operating expenses of 11.46 per cent, or nearly double. At the same time the net earnings decreased 5.56 per cent, while the

operating ratio grew from 66.57 per cent for the first six months of 1917 to 70.15 for the corresponding period of 1918.

For the companies reporting taxes the showing was even more discouraging. For them the operating revenues increased 4.83 per cent, while operating expenses increased 10.86 per cent and taxes 5.80 per cent. The net earnings, therefore, decreased 7.58 per cent, and operating income 11.16 per cent. The increase in operating ratio was practically the same for both classes, amounting in each instance to more than 3½ per cent.

The figures show that for companies which did not report taxes, there was a drop in net earnings of \$188 per mile of line, and that for the companies which did report taxes, the drop amounted to \$338 per mile of line.

As in previous compilations the most unfavorable showing was made by the companies operating in the Eastern District. The Southern District made the best showing, although even there a decrease in net earnings was shown. A glance at the operating ratios for the three districts will give a hint of the reason. The ratio for the Eastern District was 73.62 per cent, for the Western District 68.88 per cent and for the Southern District 60.76 per cent. This disparity in the cost of operation seems, moreover, to be increasing, since the rise in the Eastern District for the six months was 4.32 per cent, as compared with 3.01 per cent for the Southern and 3.07 per cent for the Western.

A somewhat different situation seems to be presented when the figures for June are considered. Then the Western

TABLE I—COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR SIX MONTHS, JANUARY-JUNE, 1917 AND 1918

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-June, 1918	Per Mile of Line			Amount, January-June, 1918	Per Mile of Line			Amount, January-June, 1918	Per Mile of Line			Amount, January-June, 1918	Per Mile of Line		
		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917
Operating revenues	\$56,760,723	\$10,707	\$10,123	5.77	\$28,014,491	\$8,957	\$8,516	5.18	\$7,435,298	\$9,385	\$8,792	6.74	\$21,310,934	\$15,426	\$14,515	6.28
Operating expenses	\$39,819,695	7,511	6,739	11.46	\$20,622,713	6,594	5,902	11.72	\$4,517,323	5,702	5,077	12.31	\$14,679,659	10,626	9,552	11.24
Net earnings	\$16,941,028	3,196	3,384	±5.56	\$7,391,778	2,363	2,614	±9.60	\$2,917,975	3,683	3,715	±0.86	\$6,631,275	4,800	4,963	±3.28
Operating ratio, per cent	1918, 70.15; 1917, 66.57				1918, 73.62; 1917, 69.30				1918, 60.76; 1917, 57.75				1918, 68.88; 1917, 65.81			
Average number of miles of line	1918, 5,301; 1917, 5,217				1918, 3,128; 1917, 3,115				1918, 792; 1917, 739				1918, 1,381; 1917, 1,363			
COMPANIES REPORTING TAXES																
Operating revenues	\$47,507,945	\$12,322	\$11,754	4.83	\$25,100,976	\$10,772	\$10,290	4.68	\$3,430,317	\$11,014	\$10,211	7.86	\$18,976,652	\$15,630	\$14,986	4.30
Operating expenses	\$33,823,741	8,772	7,913	10.86	\$18,542,122	7,957	7,171	10.96	\$2,063,197	6,625	5,674	16.76	\$13,218,422	10,888	9,926	9.69
Net earnings	\$13,684,204	3,550	3,841	±7.58	\$6,558,854	2,815	3,119	±9.75	\$1,367,120	4,389	4,537	±3.26	\$5,758,230	4,742	5,060	±6.28
Taxes	\$3,309,339	858	811	5.80	\$1,799,990	772	722	6.93	\$278,791	895	859	4.19	\$1,230,558	1,014	971	4.43
Operating income	\$10,374,865	2,692	3,030	±11.16	\$4,758,864	2,043	2,397	±14.77	\$1,088,329	3,494	3,678	±5.00	\$4,527,672	3,728	4,089	±8.83
Operating ratio, per cent	1918, 71.19; 1917, 67.32				1918, 73.87; 1917, 69.69				1918, 60.15; 1917, 55.57				1918, 69.66; 1917, 66.124			
Average number of miles of line	1918, 3,855; 1917, 3,821				1918, 2,330; 1917, 2,317				1918, 311; 1917, 308				1918, 1,214; 1917, 1,196			

TABLE II—COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR JUNE, 1917 AND 1918

Account	United States				Eastern District				Southern District				Western District			
	Amount, June, 1918	Per Mile of Line			Amount, June, 1918	Per Mile of Line			Amount, June, 1918	Per Mile of Line			Amount, June, 1918	Per Mile of Line		
		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917
Operating revenues	\$10,226,317	\$1,904	\$1,748	8.92	\$5,074,634	\$1,577	\$1,480	6.55	\$1,343,985	\$1,696	\$1,535	10.49	\$3,847,698	\$2,785	\$2,494	11.67
Operating expenses	\$7,096,673	1,315	1,138	15.55	\$3,543,735	1,101	992	10.99	\$822,701	1,038	890	16.63	\$2,724,237	1,972	1,617	21.95
Net earnings	\$3,175,644	589	610	±5.44	\$1,530,899	476	488	±2.46	\$521,284	658	645	2.02	\$1,123,461	813	877	±7.30
Operating ratio, per cent	1918, 69.07; 1917, 65.10				1918, 69.82; 1917, 67.03				1918, 61.20; 1917, 57.98				1918, 70.81; 1917, 64.84			
Average number of miles of line	1918, 5,392; 1917, 5,307				1918, 3,218; 1917, 3,205				1918, 792; 1917, 739				1918, 1,382; 1917, 1,363			
COMPANIES REPORTING TAXES																
Operating revenues	\$8,570,008	\$2,172	\$2,010	8.06	\$4,527,067	\$1,870	\$1,767	5.83	\$610,786	\$1,961	\$1,761	11.36	\$3,432,155	\$2,827	\$2,562	10.34
Operating expenses	\$6,017,160	1,525	1,325	15.09	\$3,168,608	1,309	1,193	9.72	\$371,159	1,192	1,012	17.79	\$2,477,393	2,041	1,674	21.92
Net earnings	\$2,552,848	647	685	±5.55	\$1,358,459	561	574	±2.26	\$239,627	769	749	2.67	\$954,762	786	888	±11.49
Taxes	\$590,260	150	135	11.11	\$315,385	130	119	9.24	\$48,617	156	143	9.09	\$226,258	186	165	12.73
Operating income	\$1,962,588	497	550	±5.64	\$1,043,074	431	455	±5.27	\$191,010	613	606	1.16	\$728,504	600	723	±17.01
Operating ratio, per cent	1918, 70.21; 1917, 65.92				1918, 70.00; 1917, 67.52				1918, 60.79; 1917, 57.47				1918, 72.20; 1917, 65.34			
Average number of miles of line	1918, 3,946; 1917, 3,912				1918, 2,421; 1917, 2,408				1918, 311; 1917, 308				1918, 1,214; 1917, 1,196			

† Decrease

District made much the worst showing, its decrease in net earnings amounting to 7.30 per cent, with an increase in operating ratio of almost 6 per cent. For companies reporting taxes, the increase in operating ratio was almost 7 per cent. For the country as a whole the decrease in net earnings was lower than for the six months, which may be accounted for by the unusually severe operating conditions caused by the storms of January and February. The operating ratio for the country showed, however, an increase of nearly 4 per cent. The good showing of the Southern District continued, and an actual gain in net earnings was shown.

The returns from the city and inter-urban electric railways, as shown in detail in the tables on page 533, were classified according to the following geographical grouping: Eastern District—East of the Mississippi river and north of the Ohio river. Southern District—South of the Ohio river and east of the Mississippi river. Western District—West of the Mississippi river.

Portland Financing

New Essential Industries Finance Corporation Will Probably Aid Portland Utility First

In all probability the first public utility company to receive financial aid from the Essential Industries Finance Corporation, now in the process of formation, will be the Portland Railway, Light & Power Company, Portland, Ore. There are a number of details and formalities which have to be attended to before the corporation can begin operations, however, and it will not undertake any financing until after the Liberty Loan campaign.

The Portland Railway, Light & Power Company has \$4,000,000 of notes due on Nov. 1. These notes matured on May 1 last but were extended for six months at 6 per cent. The notes originally matured May 1, 1917, but were extended for one year.

The company has outstanding \$15,000,000 of common stock, on which 75 per cent has been paid in, and \$5,000,000 each of first and second preferred stock, the second preferred being non-cumulative. Besides the notes the company has outstanding \$34,646,000 of bonds. The company serves shipyards and other war industries.

Last Obstacle Removed in Northern Electric Reorganization

The last legal obstacle, it is said, to the operation of the Sacramento Northern Railroad will be removed by the dismissal of the appeal taken to the United States Circuit Court of Appeals by the minority stockholders of the predecessor company, the Northern Electric Railway, Chico, Cal. These stockholders have compromised with the reorganization committee in regard to certain minor terms of the settlement.

P. S. C. Cuts Dividend in Half

The Public Service Corporation of New Jersey, Newark, N. J., has declared a dividend of 1 per cent, payable on Oct. 15 to stock of record on Oct. 10. Previous quarterly dividends since June, 1916, have been at the rate of 2 per cent. Thomas N. McCarter, president of the company, has authorized a statement in part as follows:

"In declaring a dividend of 1 per cent the board was governed by existing conditions and by a desire to conserve the resources of the corporation to as great an extent as possible in these unsettled times."

Boston Gains 12 Per Cent

The gross earnings of the Boston Elevated Railway during August, 1918, were only \$184,500 more than during August, 1917, or 12 per cent, in spite of the 40 per cent increase in fare. Changes since January, 1917, compare as follows:

	1918		1917	
	Inc.	Per Cent	Inc.	Per Cent
January.....	\$96,269	*5.94	\$122,000	8.2
February.....	*69,832	*4.86	31,000	2.25
March.....	*40,000	*2.5	86,500	5.56
April.....	8,000	0.5	37,000	2.33
May.....	13,000	0.8	11,500	*0.69
June.....	*44,000	*2.08	*38,000	2.5
July.....	*46,000	*3.00	70,000	4.6
August.....	369,000	23.81	40,580	2.69
September.....	184,500	12.00	13,400	0.88
October.....	.....	.....	23,000	1.42
November.....	.....	.....	20,500	1.4
December.....	.....	.....	61,800	*3.6

*Decrease.

August was the first seven-cent fare month.

It is uncertain whether the trustees will advance the fare continuously until a balance is struck or will consider the possibilities of the zone system.

Financial News Notes

Worcester & Warren Line Stops.—The Worcester & Warren Street Railway, Brookfield, Mass., has ceased to operate and will be entirely dismantled by Swift-McNutt Company, Boston. The work is now under way.

\$15,000,000 Deed of Trust Filed.—A deed of trust from the Monongahela Valley Traction Company, Fairmont, W. Va., to secure the Central Union Trust Company of New York for a loan of \$15,000,000, represented by bonds dated July 1, 1918, and maturing in five years, has been filed in the Taylor County Court of Records, located at Grafton.

San Francisco-Oakland Coupon Payment.—Funds for the payment of coupons which were due July 2, 1917, for the San Francisco, Oakland & San José Terminal Railway second mortgage 5 per cent bonds have been deposited by

the San Francisco-Oakland Terminal Railways with the Wells-Fargo Nevada National Bank, San Francisco.

Ware & Brookfield Line Going.—Swift-McNutt Company, Boston, Mass., is entirely dismantling the Ware & Brookfield Street Railway. The sale of the road to the junking company was noted in the ELECTRIC RAILWAY JOURNAL of April 27, 1918.

Preferred Dividend in Scrip.—Kelsey, Brewer & Company, Grand Rapids, Mich., announce that the regular quarterly dividend of 1½ per cent on the preferred stock of the American Public Utilities Company will be paid in scrip on Oct. 1 to holders of record on Sept. 20.

Road Will Suspend.—Officers of the Claremont Railway & Lighting Company, Claremont, N. H., say the railway will suspend service about the middle of October because of the failure of the company to pay a dividend during twenty years of operation. They say they will sell the road as junk unless a purchaser appears.

Two-Year Notes for Sale.—E. W. Clark & Company, Philadelphia, are offering at 98½ and interest \$2,500,000 of two-year 7 per cent secured gold notes of the Columbus Railway, Power & Light Company, dated July 1, 1918. The authorized amount is \$3,000,000. The offering has been approved by the Capital Issues Committee.

Three-Year Notes Offered.—A. B. Leach & Company, New York, are offering a new issue of \$450,000 of three-year 7 per cent notes of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., due on Sept. 1, 1921. The proceeds are to be used to pay for floating indebtedness incurred for betterments and additions to property.

Bids for Retiring Bonds.—The Central Union Trust Company, New York, N. Y., recently received bids from holders of the first mortgage 5 per cent sinking fund gold bonds of the New York Municipal Railway Corporation, Brooklyn, N. Y., for the sale by them to the trust company at not more than 107½ per cent of the full value of the bonds of sufficient bonds to exhaust the sum of \$190,500 under the terms of the mortgage provisions.

Parsons Line Wants to Stop.—On Sept. 24 the Parsons division of the Kansas Electric Utilities Company filed an application with the Kansas Public Utilities Commission for permission to junk its plant. The Kansas Electric Utilities Company owns and operates street car systems at Parsons, Lawrence and Emporia. The Parsons company operates about 6 miles of track. During the year from March 1, 1917, to March 1, 1918, the company lost in operating expenses and in interest on the investment \$46,614, according to the petition. During the months of March, April, May and June of this year, this loss was \$15,870, or a total of \$62,484 in sixteen months.

Traffic and Transportation

Six-Cent Fare for Trenton

New Jersey Commission Grants Emergency Surcharge and Orders Improvements in Service

The Board of Public Utility Commissioners of New Jersey on Sept. 25 granted the Trenton & Mercer County Traction Corporation, Trenton, N. J., authority to impose a 6-cent fare with free transfers on all its divisions on and after Oct. 15. The company is now charging a 5-cent fare with six tickets for 25 cents. The increase is granted as a war surcharge, and the commission retains jurisdiction for the purpose of either abrogating or altering it when conditions shall be deemed to warrant a change.

Concurrent with the fare decision the commission filed its finding on the application of the Trenton City Commission to require the company to improve its equipment and service. In this case the commission declares that the company is not rendering proper service.

SITUATION DEMANDS SIX CENTS

Under the old rate of fare the company estimated that it would have a deficit of \$297,160.12 for 1918, and even with the increase to 6 cents it will have a deficit of \$96,000 at the end of the first twelve months.

In granting permission to the company to charge the 6-cent fare the commission says:

"In the present emergency the board will not under these trying circumstances determine from the record either the total amount of property on which the petitioner is entitled to a fair return or the rate of return applicable to the property, or whether the fixed charges are properly related to such a fair return under normal conditions, but will base its conclusions in this matter upon the exigencies of the times and afford such relief as is necessary to continue service. When the present emergency shall have passed, the board will resume consideration of the case."

On this basis the commission finds that an emergency exists and that in order to render the public continuous, safe, adequate and proper service, the company will be required to raise additional revenue of at least \$201,194 a year, this being the "reasonably accurate" estimate of the company for the increase to be produced by the 6-cent fare.

IMPROVEMENT OF SERVICE

In its service finding the commission suggests that the company replace its "dinkey" cars with double-truck cars as rapidly as possible, the replacement

to occur "preferably by five new cars on or before March 15, 1919, and the remainder on or before Jan. 1, 1920." The operation of the "dinkey" cars in regular service should be stopped as soon as they are replaced, except that repaired ones may be operated on some lines for light traffic.

Other desirable changes recommended, but not ordered, are: Equip city cars with wheel guards and suburban cars with pilots; equip with air brakes ten double-truck cars that are now operated with hand brakes; remodel the present carhouses by installing a repair pit for at least four large cars at one time; provide a motor-driven line wagon, and install certain double-track connections, turnouts, sidings and additional track to provide for parking, more service and efficient routing.

The company is ordered to improve immediately the discipline of its employees, especially platform men; equip all suburban cars from twenty minutes after sundown to twenty minutes before sunrise with rear signal lights by Nov. 15; maintain cars at all times in good repair and in clean condition, to begin immediately; make necessary repairs to roof of carhouses; repair overhead special work at carhouses, replace broken or decayed crossarms, properly secure all feed wires to insulators, tighten all slack span and guy wires and repair all broken span and guy wires by Jan. 1; provide suitable fire protection at the carhouses, either by a sprinkling system or by ample hose and standpipes by Jan. 1; renew or replace broken track construction in certain sections and repair all broken rails and defective joints in all sections of the city by Feb. 1, and make several local operating changes.

Skip Stop Ordered for Portland, Oregon

The Portland Railway, Light & Power Company, Portland, Ore., has been ordered by Fred J. Holmes, fuel administrator for Oregon, to install skip stops as a war measure. In residential sections the cars will stop at every other block. In small business communities, and at points near shipyards and other industrial plants, the cars will come to a stop at each street corner.

In order to comply with another order of the fuel administrator to save "dead car mileage," the company will change the routing of the Vancouver cars. More than a quarter of a mile will be saved on each trip, or a total of more than 13 miles a day.

The government has agreed to finance a number of extensions to the Portland

Railway, Light & Power Company's lines, in order to give better service to the shipyards. These include one loop in the southern part of the city, in the neighborhood of the Columbia River Shipyards; another in the center of the city, and one in the north end.

Transfer Charge Dropped

Quebec Commission Also Includes Cut-Rate for Workmen in Final Fare Revision in Montreal

The Public Utilities Commission of Quebec, which has final jurisdiction over the fares of the Montreal Tramways, on Sept. 20 handed down a decision fixing the various rates. The preliminary decision on the part of the Montreal Tramways Commission, noted in the *ELECTRIC RAILWAY JOURNAL* of July 13, had been appealed by the company and by the various municipalities concerned.

The final decision follows that of the Montreal Tramways Commission except in two important points, viz: It abolishes the charge of 1 cent for transfers and it allows workmen to purchase six tickets for 25 cents. The first commission had made a straight 5-cent ticket rate for all classes of the community.

The fares now authorized for the City of Montreal follow:

(a) Day tariff, 6 cents cash or a ticket to be sold at the rate of five for 25 cents.

(b) School children, a ticket to be sold at the rate of seven for 25 cents.

(c) Special day tariff of a ticket to be sold at the rate of six for 25 cents, to be good only between the hours of 6 and 8 a. m. and 5 and 7 p. m. on week days only.

(d) Night tariff, 15 cents cash.

(e) Passengers paying fares shall be entitled to the receipt of a transfer free of charge.

In regard to the company's need for higher fares the Public Utilities Commission said:

"We believe we have made ample allowance for all expenditures the company may be called upon to meet and have not been more optimistic in our forecast as to revenue than the Montreal Tramways Commission. To take the franchise in its entirety, the benefit of any doubt should, in our opinion, be construed in favor of lower fares.

"It is far from an agreeable duty to a public body to increase the rates of a public utility. It is simply, however, a matter of maintaining the public utility in question as an efficient and going concern. Urban transportation in this community is essential and it cannot be for a long time maintained at less than cost.

"This has had to be recognized the world over and is a consequence of the abnormal conditions through which we are passing. We have not gone farther than necessity and the terms of the contract between the city and the company appear to demand."

Public Service Gets Seven-Cent Fare

This Temporary Rate, with Continued One-Cent Transfer Charge, Granted to Cover Increased Wages—Zone System Perhaps Before April

In order to meet the higher wage expenditures recently ordered by the War Labor Board, the Board of Public Utility Commissioners of New Jersey on Sept. 27 granted the Public Service Railway authority to charge 7 cents instead of 5 cents as its unit fare from Oct. 15 to March 31, inclusive, and 6 cents from April 1 until such time as the "war emergency" ceases to exist. In connection with the new rates the company is permitted to continue to collect 1 cent for all initial transfers, as provided in an order issued by the commission last July.

The first application of the company for higher fares, to be effective April 1, provided for a 7-cent fare, a 2-cent transfer charge and a 1-cent charge for a transfer on a transfer. That application was denied, but an order was issued in July allowing a charge of 1 cent for transfers, the commission being of the opinion that this increase would give the company the \$860,000 of additional revenue needed for rendering proper service. The commission, however, made allowance simply for the wage increases already granted by the company.

On Aug. 1 the War Labor Board handed down a decision increasing the pay of motormen and conductors, retroactive to June 7, and thereafter the company concluded that other increases were necessary to equalize wage conditions on the property. The company then on Aug. 7 applied for a 7-cent fare in addition to the 1-cent transfer charge. A hearing was held on Aug. 29, but protesting municipal representatives offered no evidence. They attacked the right of the board to alter franchise rates of fare, but inasmuch as the board had fully considered this point in its prior decision it did not reopen the point.

The simple question involved, therefore, was that of making proper provision for the wage award of the War Labor Board. The retroactive feature of this somewhat complicated the problem. It was shown, however, that the excess of the total annual wage increases effective in August, 1918, over the wage increases for which provision had been made through the 1-cent transfer charge was \$1,630,000. The excess from Aug. 1 to Dec. 31, a period of five months, would be \$680,000. The total excess up to the close of 1918 would be approximately \$860,000, which gives \$180,000 as the amount of deficiency on Aug. 1, 1918, applicable to the period prior to this date. During each month at the present rate of fare the deficit would be increased by \$136,000 (one-twelfth of \$1,630,000), and accordingly on Sept. 15 the deficiency would be approximately \$384,000 and on Oct. 15 \$520,000.

According to company counsel, the deficit accruing up to Sept. 15 would be practically wiped out at the close of the year by raising the fare on Sept. 15 from 5 to 7 cents. At the same average monthly gain in revenue, the commission calculated, the loss of \$520,000 accruing up to Oct. 15 would be made up in approximately five months. The commission therefore fixed March 31, 1919, as the proper time limit for the making up of the deficit by means of the 7-cent fare and 1-cent transfer charge.

As for the time thereafter, the commission said, the evidence showed that when the deficit was made up, a fare of 6 cents and a charge of 1 cent on each initial transfer would yield sufficient revenue to enable the company to meet its operating expenses, pay bond interest and rentals on leased properties and provide an annual appropriation of \$800,000 for depreciation.

The board, therefore, determined that the 1-cent transfer charge granted in its order of July 10 should remain unchanged and that in addition the company might charge 7 cents and 6 cents before and after April 1, 1919, respec-

tively. The new rate becomes effective on Oct. 15. The company must file monthly comparative statements of finances, wages and salaries, and the board retains jurisdiction over the increase granted.

Moreover, the company is not relieved by the present decision from complying with the requirement in the order of July 10 that the company work out and submit by Jan. 1 a zone system for its lines in order "more properly to relate the cost of service with the length of haul and the value of service." In regard to this point the board said on Sept. 27:

"The company is now and has been for some time past gathering data of traffic on its lines to be used in the preparation of such a plan, and the president assured the board that such a plan will be filed early in January. Any plan submitted will necessarily have to be investigated by experts employed by this board before adoption to ascertain the fairness of the scheme and the probable results of operation. We anticipate that it may be possible to adopt some plan before April 1. The plan with its schedule of rates when adopted will be substituted for the then existing rate."

The company's field study of the zoning question, it may be stated, is now complete, as many as 100 field observers and fifty office workers having been engaged upon the task at one time.

Business Men Approve

Labor Leaders, However, Oppose Adoption of a Six-Cent Fare for Rochester

Business interests and labor clashed on Sept. 26 at a hearing before the law committee of the Rochester (N. Y.) Common Council in attempts to show why a 6-cent fare should or should not be allowed the New York State Railways in that city.

Taking the stand that the railway is losing money with a 5-cent fare and that its service will be demoralized if something is not done for it, many leading business men appealed to the committee and the Council to give a square deal to the company as well as the people and, as patriots, to heed the advice of the National War Labor Board and allow the increase.

Labor representatives vehemently opposed any increase in fare. They suggested that if the company is making no money it turn its franchise over to the city and allow the city to operate the lines. Union leaders declared that their organizations are unanimous in opposition to a 6-cent fare, believing it unnecessary.

Chairman Carroll, in opening the meeting, briefly outlined the situation relative to the two investigation reports just filed, as noted in last week's issue. He said the Scudder report, made at the instance of the city, considered only the city lines, while the report made by

Price, Waterhouse & Company included the suburban and interurban lines of the Rochester district with the city lines.

D. M. Beach, counsel for the railway, reiterated the arguments filed in his brief recently. He concluded with the flat-footed statement that it could be shown that the city lines are now, exclusive of outside lines, operated at a deficit.

Omaha Wants Seven-Cent Fare

The application of the Omaha & Council Bluffs Street Railway, Omaha, Neb., before the Nebraska State Railway Commission for the authorization of an emergency 7-cent fare in Omaha was scheduled to be called up for final arguments on Oct. 5. The original application, filed on May 1, 1918, asked for an increase from 5 to 6 cents. The application was based on advances in materials costs and voluntary advances in wages. Before the hearing on the 6-cent application was held, the differences between the company and the men were submitted to the War Labor Board and an additional increase of wages was ordered.

The company asserts that the total of increased costs approximates \$1,200,000 for the last four years. Within this period it has used all of its surplus funds and is now without means to meet its expenses. The deficit for 1919, unless the increase applied for is allowed, will amount to approximately \$822,200.

Asks 3-Cent Transfers

New York Railways Adds a Cent to Its Original Request to Public Service Commission

In a supplemental petition filed with the Public Service Commission for the First District of New York on Oct. 1, Theodore P. Shonts, president New York Railways, asked permission to charge 3 cents for transfers, 1 cent more than was asked for in the original application filed last year.

The New York Railways, in company with the Third Avenue Railway and other New York City companies, then filed an application for a 2-cent transfer charge. On June 6, 1918, however, the commission handed down a decision in the leading Third Avenue Railway case to the effect that under the recent Rochester decision of the Court of Appeals the commission could not legally grant a transfer charge on other than a fragmentary basis and that the company should discuss with the city the question of the most advisable procedure for relief. The hearings in the several transfer cases were then held subject to call.

As noted in last week's issue, Chairman Hubbell in the present service inquiry remarked that if the company thought it advisable to renew the transfer-charge proposition it would be "hospitably entertained" by the commission. The present application for a 3-cent charge is the result, and a hearing will be set in the matter.

Mr. Shonts, as a reason for the request, says that from Jan. 1 to July 31, 1918, the company operated its lines at a loss of \$469,341, exclusive of interest on its income bonds, and that the imperative need for additional income makes the compulsory giving of free transfers "unreasonable, unjust and confiscatory."

Interborough Wants Modified Service Order

Objections to the form of an order issued by the Public Service Commission for the First District of New York, requiring the Interborough Rapid Transit Company to maintain a schedule of thirty express and twenty local trains an hour during rush hours, were made on Oct. 1 by Frank Hedley, vice-president and general manager, and James L. Quackenbush, general counsel. Both declared the order too inflexible.

"This is a serious question when the failure to live up to the order makes it a misdemeanor punishable by fine and imprisonment," said Mr. Quackenbush. He explained that while the commission would not demand the observance of the order in times of accident, prosecuting officials of the counties through which the subway operates could proceed legally against the management of the company and be strictly within their rights.

Mr. Hedley, who was the principal witness, told of the difficulty to obtain

sufficient labor and its deterioration in quality. He said the service was subjected to greater danger of interruption than in ordinary times, and therefore he did not want to be placed in the position of committing a misdemeanor by unavoidably violating the commission's order.

Before the hearing closed, Commissioner Ordway said he was reluctant to abolish the order and agreed that counsel for the commission and Mr. Quackenbush should confer as to the framing of a new one, which will be presented at the next hearing before the commission.

Referendum for Houston

The new city ordinance granting the Houston Electric Company a regular fare of 6 cents with half fares of 3 cents, noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 21, will be referred to a referendum vote. Labor union leaders have circulated petitions and have secured the necessary number of signers.

Labor leaders last week appeared before the City Commission to enter formal protest against the ordinance. In answer to the charge that the Council had acted in haste, the Mayor informed the callers that the Council began its investigation in June and did not complete it until early in September. In the meantime Lamar Lyndon, an expert employed by the city, had verified the company's figures.

Women Prove Highly Satisfactory

The Kansas City (Mo.) Railways is finding women highly satisfactory in all the positions to which they have been assigned. Up to July 9 the company had employed seventy-three women. Only nine of these failed to make good. These were for reasons usually outside of their ability to perform the tasks. On July 9 there were sixty-four women in active regular service as conductors and collectors.

One of the first of the women to receive instruction several months ago, Mrs. Edna Johnson, has been appointed as special instructor for women put into the train service. She holds a class six hours a day, giving instruction in the use of fare boxes, etc. The older conductors, however, give the women the special training on the cars.

The women were tried out gradually, first on trailers on the short lines, then as conductors and finally as front-end collectors, in the downtown districts. They have proved reliable, even on the cars carrying passengers from the resorts at night. They work as late as 11.30 p.m.

In selecting women preference is given to applicants whose husbands are in war service. A third of the women in the train service are the wives of motormen. Many of them have children. They are paid the same wages as the men and share in the 5-cent advance which was made effective on July 15.

Atlanta Mandamus

Georgia Company's Attorneys Are Trying to Make Commission Assume Jurisdiction in Fare Case

Contending that the city of Atlanta is not empowered under its charter to contract with the Georgia Railway & Power Company as to the rate of fare to be charged within the city limits, attorneys for the company have presented their case before Judge George L. Bell, of the Fulton Superior Court, in the mandamus proceedings brought to compel the State Railroad Commission to assume jurisdiction in the matter of granting an increased fare in Atlanta and suburban communities.

Counsel for the city and the special citizens' committee opposing the proposed increase contend that statutes contained in the code of 1899 confer upon the municipality the necessary charter powers, and that many years before the organization of the Georgia Railway & Power company as such, contracts had been entered into between the city and the railway corporation fixing the fare at 5 cents for one full trip.

The mandamus proceedings brought by the company is the result of the action of the commission in ruling that it had no jurisdiction over the fares in Atlanta, because these were fixed by contract made prior to the organization of the commission in 1907. The commission handed down this ruling several weeks ago, as noted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 31, along with its decision increasing electric light, power and gas rates in Atlanta. The company had asked not only for the light, power and gas increases, but also for a 6-cent carfare and a 2-cent charge for transfers.

The commission, in refusing a higher railway rate, called attention to the fact that under the statute creating the commission it is expressly provided that the commission shall have no authority to alter existing contracts between municipalities or private corporations and public utility enterprises. The commission admitted that the company was entitled to a higher fare and that a 6-cent fare without a charge for transfers would be reasonable and just.

After the conclusion of arguments in the mandamus proceedings Judge Bell announced that he would allow counsel ten days in which to file briefs.

Grade-Crossing Stop for Autos

At the recent meeting of the National Safety Council held in St. Louis, H. B. Adams, safety engineer Aurora, Elgin & Chicago Railroad, represented the Illinois Electric Railway Association. Mr. Adams presented the draft of a bill requiring automobiles to come to a full stop before a grade crossing and succeeded in having this adopted by the electric railway section, the steam railroad section and the public safety section, and referred to the executive committee for its approval.

Transportation News Notes

Seven-Cent Rate Wanted in Fitchburg.—The Fitchburg & Leominster Street Railway, Fitchburg, Mass., has asked the Public Service Commission for permission to raise its fare unit from 5 to 7 cents on Oct. 19.

Increase in Fare Asked.—The Murphysboro & Southern Illinois Railway, Murphysboro, Ill., on Sept. 27 filed a petition with the Public Utilities Commission for an increase in passenger fare between Murphysboro and Carbondale.

Fare Increase in Mattoon.—The Illinois Public Utilities Commission has authorized a 6-cent fare on the properties of the Central Illinois Public Service Company, including Mattoon, Taylorville and Charleston. The authorization is effective over a period of one year.

Humboldt Rides for Six Cents.—On Oct. 1 a 6-cent fare became effective on the lines of the Humboldt Transit Company, Eureka, Cal. For the convenience of the public strips of six tickets each are sold at different places in the city, but there is no reduction in price.

Athens Asks Seven-Cent Rate.—The Athens Railway & Electric Company, Athens, Ga., has filed an application with the State Railroad Commission for authority to make increases in its light and power rates, and to increase the street car fare from 5 to 7 cents and to sell four tickets for 25 cents. The commission has set the case down for hearing on Oct. 8.

Six-Cent Fare for Springfield, Ill.—The Illinois Public Utilities Commission has authorized the Springfield (Ill.) Consolidated Railway to increase fares for a period of one year as follows: Adult fare, 6 cents, and nine tickets for 50 cents; school children's tickets, thirty-five for \$1; children over six years of age, same fare as adults, and children under six years of age, free.

Fare Hearing Postponed.—The hearing on Sept. 25 in regard to the application of the Atlantic Coast Electric Railway, Asbury Park, N. J., for a 7-cent fare was abandoned by the Board of Public Utility Commissioners of New Jersey until Oct. 9, to permit the company to prepare valuation and operating figures for its railway property as distinct from its lighting property.

Mayor Recommends Fare Increase.—Mayor J. F. Rall of Cedar Rapids, Iowa, after receiving a report from Billings, Prouty & Tompkins on the financial status of the Cedar Rapids & Marion City Railway, made the following statement: "The report shows that in order

to pay its present wages and to meet the increased costs of coal and the like, the company will need an increase in fare, and if the company is to continue business on its present basis the raise must be granted."

Accountants See Need.—The audit of the books of the Muskegon Lighting & Traction Company, Muskegon, Mich., has been completed by the firm of Touche, Niven & Company, accountants, and in their report filed with the city they hold that the company is entitled to a 6-cent fare and also an increase of 25 cents per 1000 cu. ft. in the price of gas. Council held an informal meeting recently to go over the report but no action has been taken on the matter.

Injunction Filed Against State.—The Alton, Granite & St. Louis Traction Company, Alton, Ill., has filed an injunction restraining officials of the State from interfering with the charging of a 3-cents-a-mile rate on its lines. The matter is now before a master in chancery. This company, together with the East St. Louis Railway, has filed application with the Illinois Public Utilities Commission for permission to charge an 8-cent cash fare and a 7½-cent ticket fare in East St. Louis and Alton.

Coney Island Commutation Restored.—At a hearing on Sept. 30 before the Public Service Commission for the First District of New York the Brooklyn Rapid Transit Company announced that the Coney Island commutation rate, which had been suspended on Sept. 15, would be restored. The company on Sept. 14 filed a new tariff for Coney Island, which established a 10-cent fare from Coney Island to Manhattan. The commutation rate had been 5 cents each way to and from Manhattan up to that date, during certain hours of the morning and afternoon, for the accommodation of business commuters.

Fare Appeal in Beaumont.—The East Texas Electric Company, which operates the Beaumont Traction lines, the Port Arthur traction lines and the Beaumont-Port Arthur Interurban line, has announced that greater revenue is necessary if it is to continue to operate its plant and maintain the present efficiency and standard of service. The company will go before the City Council and ask for authority to increase its city fares possibly to 7 cents. The additional revenue it is stated, is needed to meet additional cost of operation, particularly wage increases, the wages of motormen and conductors having been fixed by the War Labor Board at 38 cents to 42 cents an hour.

Skip Stops and Staggered Hours Help.—Officials of the Lehigh Valley Transit Company, Allentown, Pa., report that the system of skip stops which has been in operation for some time in Allentown, Pa., has resulted in a better adherence to schedules and improved service. In all, 234 stops were eliminated and in general there have been no complaints from the public. Early closing of the stores and a system of staggered

hours which has been instituted at some of the industrial plants have scattered the traffic morning and evening and helped to relieve congestion. The Bethlehem Steel Company is co-operating with the railway in a study of the question of staggering its working hours with a view to bettering existing conditions.

Seven-Cent Fare for Galesburg.—The Public Utilities Commission of Illinois on Sept. 18 approved the tariff filed by the Galesburg Railway, Light & Power Company, included in the Illinois Traction System. The new rates follow: Adults, 7 cents; four tickets for 25 cents and ten-coupon books for 60 cents; children under five, accompanied by adults, free; children five years or more, the same fare as adults. The rates are to continue in effect not longer than six months after the war has been terminated. The fare application went to the commission with a recommendation in its favor from the City Council.

Fare Increase in La Crosse.—The Wisconsin Railway, Light & Power Company has been authorized by the Railroad Commission of Wisconsin to put a 6-cent fare into effect at La Crosse. The order provides for books of eighteen tickets to be sold for \$1, also for 5-cent workmen's tickets to be sold in strips of six tickets each, good for transportation from 6 a. m. to 8 a. m. and from 5 p. m. to 7 p. m.; also for 4-cent school tickets. These several varieties of tickets are increased rates over similar tickets which have been in use. The city fares of the company at Green Bay were increased to 6 cents on Aug. 10 and the interurban fares there have been increased to 3 cents per mile. On Aug. 10 the city fares of the company at Manitowoc were increased to 6 cents and on the interurban line from Manitowoc to Three Rivers to 3 cents per mile for interurban passengers.

Shuttle Operation Succeeds in New York.—Under the authorization of the Public Service Commission for the First District of New York, the Interborough Rapid Transit Company on Sept. 29 resumed the operation of crosstown service on the Forty-second Street shuttle between east and west side subway lines. This service was discontinued on Aug. 3, after the opening of the new lines, partly because the general public was unfamiliar with the plan of operation and also partly because changes in the track and terminal layouts at Times Square and the Grand Central station had not been completed. Now, with the construction work progressing and with colored guide lines painted on the ceilings of the shuttle passageways, the public is being well handled. This work is facilitated, of course, by the fact that the suspension of the shuttle service for a time has taught many New Yorkers how to use the through uptown and downtown lines so as to avoid a crosstown transfer at Forty-second Street.

Personal Mention

More Responsibilities for Mr. Fehr

Now in Charge of Various Lighting Properties in Addition to Railways—Mr. Patterson New Railway Manager

An announcement of considerable moment in public utility circles is the statement that H. R. Fehr, president Lehigh Valley Transit Company, Allentown, Pa., the Easton Transit Company and the Lehigh Valley Light & Power Company, has also been placed in charge of several electric light and power and gas companies whose headquarters are in Allentown.

A brief outline of the gas and electric interests now under the management of Mr. Fehr follows: The Lehigh Valley Light & Power Company, operating throughout the Allentown-Bethlehem district; the Northumberland County Gas & Electric Company, operating in Sunbury, Milton and Northumberland; the Columbia & Montour Electric Company, which supplies gas as well as electric light and power in Berwick, Bloomsburg and Danville; the Harwood Electric Company, operating in Freeland, McAdoo and Hazleton; the Stroudsburg Electric Company; the Schuylkill Gas & Electric Company, operating in Shenandoah and Mahanoy City; the Lehigh Navigation Electric Company; the Northern Central Gas Company, operating at Williamsport, and the Hagerstown Light & Heat Company, operating at Hagerstown, Md.

Mr. Fehr was elected president and general manager of the Lehigh Valley Transit Company in 1913. Prior to that time he had been city engineer for Easton from 1891 to 1899. In 1904 he became general manager and in 1905 president of the Easton Transit Company, which is now a part of the Lehigh Valley Transit Company system. In 1911 Mr. Fehr was president of the Pennsylvania Street Railway Association.

NEW TRANSIT MANAGER

H. H. Patterson, of Philadelphia, has been elected vice-president and general manager of the Lehigh Valley Transit Company, in which capacity he will direct the operations of the transit company and its subsidiaries. Mr. Patterson has been associated with the management of a number of street railways in the East, including a period of ten years of service with the Easton Transit Company. He is now in charge of the transportation facilities of one of the plants of the DuPont Powder Company.

In the electric light and power and gas departments of the organization, Mr. Fehr will be assisted by John S. Wise, Jr. Mr. Wise was formerly man-

ager of the Harwood Electric Company and the Lehigh Navigation Electric Company.

Capt. Arthur A. Mitten, a son of T. E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, is reported a prisoner in a German camp. Captain Mitten is a medical officer in charge of Ambulance Company 125, Thirty-second Infantry.

Charles Hamilton, formerly general shop foreman Springfield (Ohio) Railway, has been appointed acting master mechanic, vice Joseph H. Towle, who has accepted the position of assistant electrical engineer with the Railway Improvement Company.

R. O. Wortman, formerly manager of the securities department of the Northern States Power Company at Minneapolis, Minn., has been transferred to the Chicago office of the bond department of H. M. Bylesby & Company, who operate the Northern States Power Company.

C. B. Zeigler has been appointed treasurer of the Kansas Electric Utilities Company, with headquarters in New York City, to succeed L. A. Pettit, Jr., who severed active connection with the company to engage in the business of controlling and managing public utility properties.

E. J. Cooney, reported in the issue of this paper for Sept. 21, 1918, as having resigned his position in the publicity department of the Rhode Island Company, has been engaged to handle the publicity end of the campaign of United States Senator LeBaron B. Colt for re-election.

H. C. Foss, for the last five years acting manager of the Savannah (Ga.) Electric Company, has been appointed by Stone & Webster as acting district manager for the Southeastern district. Mr. Foss became connected with the Savannah Electric Company in 1912 as general superintendent, previous to which time he was manager of the Cape Breton Electric Company, Ltd., Sydney, N. S.

B. L. Grooms, for the last few months superintendent of the transportation of the Key West (Fla.) Electric Company, has been appointed acting manager of the company to succeed R. G. Carroll, who has been appointed acting manager of the Savannah (Ga.) Electric Company. Before becoming superintendent of the Key West Electric Company, Mr. Grooms was for some time superintendent of transportation of the Savannah Electric Company.

R. G. Carroll, who has been manager of the Key West (Fla.) Electric Company, has been appointed acting manager of the Savannah (Ga.) Elec-

tric Company to succeed H. C. Foss, who has been appointed by Stone & Webster as acting district manager for the Southeastern district. Mr. Carroll has been connected with Stone & Webster properties for a number of years, during which time he has acted as assistant treasurer of the Pensacola Electric Company, assistant treasurer of the Northern Texas Traction Company and acting manager of the Beaumont Street Railway, the Beaumont Lighting Company, the Beaumont & Port Arthur Interurban Railway and the Port Arthur Lighting Company.

G. Sabin Brush has resigned as superintendent of transportation of the Springfield (Mass.) Street Railway to accept a position as superintendent of the Houston (Tex.) Electric Company, a Stone & Webster property. Mr. Brush has been in the employ of the Springfield Street Railway since last March. Prior to that time he was for three years superintendent of the railway department of the Cumberland County Power & Light Company, Portland, Me., where he had direct charge of operation of about 107 miles of city and suburban trackage. During this time he was actively identified with the Cumberland County company section of the American Electric Railway Association and was regarded as one of the best of the younger operating executives in New England electric railway circles. Before his work in Maine Mr. Brush gained much experience in the transportation departments of the Middlesex & Boston Street Railway and the Boston Elevated Railway.

Obituary

Maskell E. Curwen, European manager of the J. G. Brill Company, died on Oct. 1 from pneumonia, after a short illness in Philadelphia. Mr. Curwen joined the staff of the J. G. Brill Company more than twenty-five years ago and had been European manager for more than twenty years, with offices in London and Paris. He was educated at the Episcopal Academy, Philadelphia. His first years in the car and truck industry gained him an intimacy with the details of manufacture and a practical knowledge of the railway field, especially of British and Continental practice, which, with his natural capacity for adapting himself to conditions as he found them, made him of value to the foreign clients of his company. He was widely known and esteemed for his upright character, lovable nature and innate refinement. His loss is deeply felt by a wide circle of friends on both sides of the Atlantic and by his business associates. Mr. Curwen was a member of the American Society in London and of the American Club in Paris. He is a brother of Samuel M. Curwen, president of the J. G. Brill Company.

Manufactures and the Markets

D. SCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Demand for Car Wheels Limited to Maintenance Needs

No Stock Carried Because of Wide Range of Sizes Demanded for Electric Railway Use

Wheels the electric railway industry certainly must have in order to carry on its business of transportation, but in spite of that fact the demand may be greatly reduced when it is limited to the requirements of maintenance. That is practically the condition today. Wheels wear out, and unlike some equipment, have to be renewed at once. But as the construction of new rolling stock is practically limited to that essential for the transportation of shipbuilders, munitions workers, and employees of other industries essential to the speedy culmination of the war, the demand for wheels has been considerably reduced. Thus the manufacturers of rolled and cast-steel wheels report a small demand from the electric railway field and this limited mostly to repeat orders, while the manufacturers of iron wheels report that orders from this source are slightly less than normal. Government requirements have increased in much greater proportion than those for the electric lines have decreased, so that increased facilities in manufacturing rather than a curtailment have been necessary.

It must be borne in mind, however, that the steam railroad wheel is standard, while wheels for electric railway use vary through a wide range of sizes. For many years it has been a source of great discomfort to wheel manufacturers that electric railways could not decide on a few standard sizes of wheels and thus eliminate the necessity of carrying, and constantly adding to, an endless number of patterns. Orders for the various sizes are small, thus making the overhead charges high, in comparison with those on wheels for steam railroads which are purchased in carload lots all from a standard size. For this reason electric railway business cannot be of primary importance with manufacturers.

The standard 33-in. steam railroad wheel is the only one now carried in stock. Consequently deliveries of other sizes cannot be made in much less than three to four months except on priority order. There is no curtailment of the supply of raw material for the manufacture of wheels so that all demands for essential maintenance and construction can be filled. The construction of much needed rolling stock is being postponed until after the war and for this

reason manufacturers are optimistic that with a possible future decrease in government demands for the steam railroads there will be a comparatively large increase in the demand for electric railway use.

Higher Prices Recorded

Weather Proof Wire, Pole Line Hardware Cambrics and Schedule Material Increased

A number of increases in price have been reported very recently. The higher prices are due largely to the demands of labor and in some cases also to raw materials. The increase in price of lamps will be found in another column.

Weather proof wire went higher this week. One manufacturer advanced his price 2 cents a pound and another large producer, it was learned, added 2½ to 3½ cents a pound to his price. Wire base, however, still ranges from 30 to 37 cents. Considering discounts, however, this amounts roundly to 34 cent base.

Varnished cambric advanced in price about 10 per cent on Sept. 15. Further price movements will be governed largely by the price of cotton.

An increase in the price of pole-line hardware of from 10 to 20 per cent has been made in the last couple of weeks. Other recent advances include schedule wiring material in the neighborhood of 10 to 20 per cent and insulated wires in varying amounts.

Change in Quality of Crossarms

The Pacific Northwestern Lumber Mills have notified their distributors of a change of quality of wood used in crossarms. This has occurred because the United States government is demanding the best grade of Rainier fir for aircraft production and the cheaper grades of yellow pine for ship construction. This leaves an intermediate grade only for crossarms in amounts, it is reported, insufficient to apply against the demands anticipated on account of the difficulty in securing labor and cars.

At the present time utility operators are beginning to think of pole and crossarm strengthening against the winter storms. To some extent, of course, the demand on the available supply will be tempered by the curtailment of new construction by the telephone and lighting companies. Nevertheless, it would appear from this report that if orders for such material are to be considered they should be placed early.

Railway Not Anticipating Sleet Cutter Needs

Supply Is Adequate But Procrastination in Purchase Should Not Be Practiced

During a recent conversation with a manufacturer's agent he said: "Do you know, the most serious trouble with electric railway managers to-day is that they can't or won't look ahead far enough?" This is true to a considerable extent, but whether it is any more typical of the buyers in the railway industry than of any other line of business, it is difficult to state.

In the case of sleet cutters, for instance, the tendency to postpone purchase applies right now. Every electric railway located in a zone where more or less severe sleet conditions are not only possible but very probable, would naturally be expected to have on hand or order by this time enough sleet cutters to take care of its needs throughout the coming winter months. Such, however, is not the case and the trade foresees similar conditions to last year when the purchase of cutters was postponed until the necessity had arisen. At that time roads rushed into the market for two, ten or fifty cutters and wanted them at once. As a rule they could be and were accommodated simply because the distributor happened to have a stock. There were cases, however, where such good fortune did not exist and poor operation and service delays were the result.

Manufacturers of sleet cutters report no activity in buying, stating that this is nothing surprising as the main activity always comes when the storm is on. In anticipation of this urgent demand, one manufacturer reports enough sleet cutters in stock to fill all demands for the coming winter based on sales for the past years. Immediate deliveries are, therefore, possible. Raw materials are scarce and it is reported that in the near future it may be impossible to obtain any malleable castings whatever. Due to this scarcity and the increased cost of the castings, the price of this equipment has advanced from 20 to 30 per cent. Although no further advance is contemplated at this time, it is to the advantage of the railways to order now.

Coal Conveyers Higher

Effective Oct. 1, the John F. Godfrey Company materially advanced the prices of coal conveyers. Conveyers can now be had on thirty days' delivery.

Coal Production Falls Off

Slight Slump in Bituminous—Strike Causes Large Decrease in Anthracite Output

Bituminous coal production during the week ended Sept. 21 varied but little from the week preceding and is estimated at 12,650,000 net tons, according to the regular weekly statement of the Geological Service. This output, while 0.4 per cent below the production during the week of Sept. 14, exceeded production during the corresponding week of 1917 by 2,060,000 net tons or 19.4 per cent. It will be noted that while the decrease in production during the week ended Sept. 21 was slight, compared with the week preceding, the decrease during the corresponding week of 1917 compared with the week of Sept. 14, 1917, amounted to 387,000 net tons or 3.6 per cent, thus interrupting for the second successive week parallelism of the curve of daily production this year and last maintained during the past three months. The daily average during the current week is estimated at 2,108,000 net tons, slightly lower than the week preceding, but considerably in excess of the daily average (1,765,000 net tons) during the week of Sept. 21, 1917.

The strike in the anthracite fields during the week ended Sept. 21 caused production to decrease 11.3 per cent. The output is estimated at 1,847,000 net tons as compared with 2,088,000 net tons during the week preceding, and as against 2,006,000 net tons during the

corresponding week of 1917. The daily average during the current week is estimated at 308,000 net tons, considerably less than the daily average for the coal year to date of 337,000 net tons, which is 2.1 per cent of the daily average of the same period of last year.

Electrical Jobbers on Preference List

War Industries Board Issues Statement Regarding Rating of Supply Men

Electrical jobbers have been given a place on the priorities list with a class B-4 rating. In order however to take advantage of this rating, each jobber must make a standard material conservation pledge.

In its statement regarding the classification of the electrical supply jobber, Judge E. B. Parker, priorities commissioner, War Industries Board, stated:

"It is in the public interest that all jobbers, wholesalers, and resale distributors of, and dealers in, electrical equipment, apparatus, appliances and supplies should be permitted to maintain reasonable stocks from which government agencies, war industries, contractors and the civilian population may draw to meet essential requirements. Such persons, however, should recognize the existing necessity for rigid economy in the use of all such products and their duty to see that such products shall be devoted to essential uses and they should pledge their wholehearted co-operation in such a program."

Incandescent Lamps Advance

Increases of 5 Cents on Small Sizes and 15 Cents on the 94-Watt Sizes Are Announced

Effective Oct. 1, vacuum incandescent Mazda lamps increased in price roughly 15 per cent. Electric railway lamps for 525-650 volt circuits are now listed as follows: 23-36 watts, 35 cents clear, 33 cents frosted; 56 watts, 40 cents clear, 45 cents frosted; 94 watts, 85 cents clear, 92 cents frosted. This is an advance of 5 cents per lamp on the 23 and 36-watt sizes, 5 cents on the 56-watt clear and 6 cents frosted and 15 cents on the 94-watt size.

According to the contract forms of last November, the manufacturers reserved the privilege to increase the price of lamps during the life of the contract (one year) by not more than 10 per cent on any one lamp to consumers who hold these contracts. The new contract forms, which are just out, are similar to these others except that a provision is made that the price during the life of the contract shall not advance more than 15 per cent over the prices in effect at the time the contract started.

The Shephard Electric Crane & Hoist Company, Montour Falls, N. Y., announces that it has appointed A. J. Barnes as export manager with headquarters at the main office. Mr. Barnes will also continue to be director of publicity.

NEW YORK METAL MARKET PRICES

	Sept. 18	Oct. 3
Copper, ingots, cents per lb.	26	26
Copper wire base, cents per lb.	29.25	28.75
Lead, cents per lb.	8.05	8.05
Nickel, cents per lb.	40	40
Spelter, cents per lb.	9.85	9.35
Tin, Chinese*, cents per lb.		
Aluminum, 98 to 99 per cent., cents per lb.	†33.10	†33.10

* No Straits offering. † Government price in 50-ton lots or more, f. o. b. plant.

OLD METAL PRICES—NEW YORK

	Sept. 18	Oct. 3
Heavy copper, cents per lb.	23.50 to 24.50	23.50 to 24.50
Light copper, cents per lb.	21.00 to 21.50	21.00 to 21.50
Red brass, cents per lb.	23.00 to 24.00	22.00 to 23.00
Yellow brass, cents per lb.	15.50 to 16.00	15.50 to 16.00
Lead, heavy, cents per lb.	7.50 to 7.75	7.50 to 8.00
Zinc, cents per lb.	7.50 to 7.75	7.50 to 8.00
Steel car axles, Chicago, per net ton	\$41.52	\$41.52
Old carwheels, Chicago, per gross ton	\$29.00	\$29.00
Steel rails (scrap), Chicago, per gross ton	\$34.00	\$34.00
Steel rails (relaying), Chicago, gross ton	\$60.00	\$60.00
Machine shop turnings, Chicago, net ton	\$16.25	\$16.25

ELECTRIC RAILWAY MATERIAL PRICES

	Sept. 13	Oct. 3
Rubber-covered wire base, New York, cents per lb.	30 to 37	33 to 37
Weatherproof wire (100 lb. lots), cents per lb., New York	32.40 to 36.75	34.40 to 36.75
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.00 to 37.72	35.00 to 37.72
T rails (A. S. C. E. standard), per gross ton	\$70.00 to \$80.00	\$70.00 to \$80.00
T rails (A. S. C. E. standard), 100 to 500 ton lots, per gross ton	\$67.50	\$67.50
T rails (A. S. C. E. standard), 500 ton lots, per gross ton	\$62.50	\$62.50
T rail, high (Shanghai), cents per lb.	4½	4½
Rails, girder (grooved), cents per lb.	4½	4½
Wire nails, Pittsburgh, cents per lb.	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb.	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb.	8	8
Tie plates (flat type), cents per lb.	*3½	*3½
Tie plates (brace type), cents per lb.	*3½	*3½
Tie rods, Pittsburgh base, cents per lb.	7	7
Fish plates, cents per lb.	*3½	*3½
Angle plates, cents per lb.	*3½	*3½
Angle bars, cents per lb.	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.90	4.90
Steel bars, Pittsburgh, cents per lb.	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	4.35	4.35

	Sept. 18	Oct. 3
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount †	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes AA quality), New York discount	79%	79%
Waste, wool (according to grade), cents per lb.	16 to 25	15 to 25
Waste cotton (100 lb. bale), cents per lb.	12 to 13	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	\$38.50	\$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	\$42.50	\$42.50
Asphalt filler, per ton	\$45.00	\$45.00
Cement (carload lots), New York, per bbl.	\$3.20	\$3.20
Cement (carload lots), Chicago, per bbl.	\$3.34	\$3.34
Cement (carload lots), Seattle, per bbl.	\$3.68	\$3.68
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.90	\$1.90
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.92	\$1.92
White lead (100 lb. keg), New York, cents per lb.	14	14
Turpentine (bbl. lots), New York, cents per gal.	66½	64

* Government price. † These prices are f. o. b. works, with boxing charges extra.

Franchises

Los Angeles, Cal.—The Pacific Electric Railway has received permission from the City Council to construct and operate a new line to connect its Ionia Avenue-Hawthorne system with the line extending from Delta Avenue to San Pedro, via Gardena.

Bridgeport, Conn.—The Board of Aldermen recently granted the Connecticut Company permission to lay tracks from North Avenue through Boston Avenue to East Main Street by request of the United States Housing Corporation. This grant was made to provide transportation for munition workers who will occupy houses under construction by the United States Housing Corporation near Old Mill Green. It will be a single track with a turnout near Noble Avenue.

Allentown, Pa.—The Public Service Commission of Pennsylvania has granted permission to the Lehigh Valley Transit Company to construct extensions to its lines in Bethlehem.

Track and Roadway

Municipal Railway of San Francisco, San Francisco, Cal.—Mayor James Rolph was authorized recently by the Board of Supervisors to enter into an agreement with the United States government accepting the offer of a loan of \$450,000 for the construction of a municipal car line from Army Street to the Hunters Point drydock and repair yards. Priority orders to secure steel rails have been promised by A. Merritt Taylor, director of transportation of the Emergency Fleet Corporation. It is expected to have the entire line operating to Hunters Point within ninety days, according to the estimates of the City Engineer's office. Proceedings to permit the operation of municipal cars over the Army Street line of the United Railroads under the agreement whereby the city secures the use of the tracks by paying one-half of the construction charges will be instituted at once, it is said.

Northern Pacific Railroad, St. Paul, Minn.—To do away with the steam motive power in the Northern Pacific Railroad yards, the company is now electrifying the line within the city limits of Coeur d'Alene, Idaho.

St. Louis, Mo.—Two cars have been purchased by the Municipal Bridge Commission of St. Louis and it is as stated that operation of the street car line over the Free Bridge will be begun by the city about Nov. 1.

United Railways, St. Louis, Mo.—Operation has been begun by the United Railways on the Hamilton Avenue extension through the HI-Pointe subdivision to the city limits at Wydown.

Moncton Tramways, Electricity & Gas Company, Ltd., Moncton, N. B.—The construction of an extension to Sunny Brae is being contemplated by the Moncton Tramways, Electricity & Gas Company, Ltd.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—In connection with a recent decision of the Board of Public Utility Commissioners of New Jersey granting the Trenton & Mercer County Traction Corporation a 6-cent fare on its lines, the company is required to make material improvements in its equipment and service. The changes recommended include the remodeling of the present carhouse by installing a repair pit for at least four cars at a time and the construction of track connections, turnouts and extensions to provide for more efficient routing of cars.

International Railway, Buffalo, N. Y.—Plans are under consideration by the International Railway for improvements to its system on Broadway, Buffalo.

Northampton, Easton & Washington Traction Company, Easton, Pa.—A United States Naval Base Hospital is to be established between Phillipsburg and Stewartsville, along the Delaware, Lackawanna & Western Railroad and the Northampton, Easton & Washington Traction Company. The construction of 16 miles of railroad will be required.

Virginia Railway & Power Company, Richmond, Va.—The War Industries Board has authorized a loan of \$1,110,000 to the

Virginia Railway & Power Company for improvements to its lines in Portsmouth and Norfolk. The board has also authorized an expenditure of \$1,000,000 for electrical power and gas war-time facilities, to include high-tension power connections between Richmond, Petersburg, Suffolk, Portsmouth and Norfolk, additions to power plants in all cities and ultimate connection with hydro-electric developments on Roanoke River, upon which the government will expend several million dollars.

Power Houses, Shops and Buildings

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—The power house of the Fort Wayne & Northern Indiana Traction Company at Fort Wayne was damaged by fire recently, causing a loss of about \$80,000.

United Railways, St. Louis, Mo.—Repairs will be made by the United Railways to its carhouse at St. Louis at a cost of \$9,000.

Southwest Missouri Railroad, Webb City, Mo.—A contract has been awarded by the Southwest Missouri Railroad to Willard Shults, Baxter Springs, Kan., for the construction of a new passenger station at Picher at a cost of \$4,000.

Public Service Railway, Newark, N. J.—Plans are being made by the Public Service Railway for the construction of an administration building at the new terminal at Broadway and Morgan Street.

Hudson (N. Y.) Power Corporation.—Work has been nearly completed on the erection of an electric transmission line by the Hudson Power Corporation from Poughkeepsie to Athens, 37 miles. The corporation is a merger of the Albany Southern Railroad Company, Hudson; the Central Hudson Gas & Electric Company, Poughkeepsie, and the American Electric Company, New York. It is proposed to develop power in the Wallkill Valley and transmit it over this line throughout the region in which the three companies operate.

Pennsylvania Railroad, Philadelphia, Pa.—In connection with extensive improvements and additions to the shop buildings at Altoona, the Pennsylvania Railroad plans to increase the capacity of its power plant at South Altoona for the furnishing of electric service for the operation of its Twelfth Street machine shops. It is planned to install two new 5,000-kw. generators in the proposed new addition, the entire work being estimated to cost more than \$1,000,000.

Philadelphia Rapid Transit Company, Philadelphia, Pa.—Plans have been filed by the Philadelphia Rapid Transit Company for extensions to its repair shops at Forty-ninth Street and Woodland Avenue, to cost about \$45,000.

Eastern Pennsylvania Railways, Pottsville, Pa.—Construction of a new carhouse has been completed by the Eastern Pennsylvania Railways at Pottsville.

Northern Texas Traction Company, Fort Worth, Tex.—The dancing pavilion of the Northern Texas Traction Company at Lake Erie was recently destroyed by fire, causing a loss of \$15,000.

Houston, Richmond & Western Traction Company, Houston, Tex.—The Houston, Richmond & Western Traction Company has leased dam and water power rights on the Guadalupe River in the vicinity of Gonzales and will build a large hydroelectric plant. Electrical energy will be used to operate the proposed interurban railway to be constructed between Houston and San Antonio, a distance of more than 200 miles. Considerable progress has been made in arranging the preliminary plans for building the line. The survey was finished some time ago and most of the right-of-way has been secured. Ed. Kennedy, Houston, president. [July 13, '18].

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A new substation will be erected by the Puget Sound Traction, Light & Power Company, at 3773 Fourteenth Avenue, Northeast, at a cost of \$3,500.

Monongahela Valley Traction Company, Fairmont, W. Va.—An addition will be built by the Monongahela Valley Traction Company to its power plant at Hutchinson.

Rolling Stock

American Railways Company, Philadelphia, Pa., is reported to have ordered twenty-two cars with pneumatic control from the J. G. Brill Company.

Philadelphia (Pa.) Rapid Transit Company has ordered thirty new cars from the J. G. Brill Company. These cars, which were originally purchased by the government for the Philadelphia Railways, have been transferred to the Rapid Transit. The Brill Company has been building them for some time.

San Francisco-Oakland Terminal Railways, Oakland, Cal., it was announced by one of the directors of the company, will receive a loan through the Emergency Fleet Corporation of \$500,000 to purchase rolling stock for the Key Route System. The rolling stock requirements, mentioned in the Aug. 24 issue of twenty-five one-man cars, twenty-five center-entrance cars, ten rail cars, four dump cars and one electric locomotive, call for an expenditure of \$516,212 or a little more than the loan mentioned above. As mentioned in these columns last week the rail cars are being built by the company.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been awarded a 6-cent fare by the New Jersey Board of Public Utility Commissioners. In its order the commission made the following suggestions: That the company replace its short cars with double-truck cars as rapidly as possible, the replacement to take place preferably by five new cars on or before March 15, 1919, and the remainder by Jan. 1, 1920; that short cars now out of commission be repaired; that city cars be equipped with wheel guards and suburban cars with pilots and that ten double-truck cars now operated with hand brakes be equipped with air brakes. Plans are now being drawn for the five additional cars, it has been announced.

Trade Notes

Horace N. Trumbull, advertising manager of the SKF Ball Bearing Company of Hartford, Conn., has entered the Reserve Officers Training Camp at New Haven, Conn.

Roller-Smith Company, New York City, has appointed as its agent W. G. Merowitz, 716 Ellicott Square, Buffalo, N. Y. Mr. Merowitz will handle the company's lines of instruments, meters and circuit breakers in the western part of New York State.

Under-Feed Stoker Company of America has moved its Detroit headquarters from 42 Alger Avenue to 307 Majestic Building, where large accommodations have been obtained which have been necessary on account of the steadily increasing business of the company.

National Conduit & Cable Company, Inc., and the **National Brass & Copper Tube Company, Inc.**, have announced the appointment on Sept. 1 of A. G. Chapin as New England manager of both the companies, with the headquarters at 200 Devonshire Street, Boston.

New Advertising Literature

Wilkins U. Greene, Ridgewood, N. J.: Circular telling of his "Force-Lute" insulating cement.

Taft-Peirce Manufacturing Company, Woonsocket, R. I.: Distributing a catalog of its toolroom specialties.

United States Graphite Company, Saginaw, Mich.: General catalog No. 20, which describes the company's graphite products.

R. H. Beaumont Company, Drexel Building, Philadelphia, Pa.: Catalog No. 38, describing and illustrating the Beaumont drag scraper system for the ground storage of coal.

General Electric Company, Schenectady, N. Y.: Circular No. 45,203, which describes type H circular-coil form KDD transformers, oil-insulated, self-cooled or water-cooled.

Pelton Water Wheel Company, San Francisco, Cal.: Pamphlet under the title "Improvements in Water Wheel Efficiency," based on studies made by C. E. Hutchinson, chief engineer of the company.